PB83-180539

Descriptive Summary: Survey of Operating and Financial Characteristics of Community Water Systems

Temple, Barker and Sloane, Inc.
Lexington, MA

Prepared for

Environmental Protection Agency
Washington, DC

7 Oct 82

U.S. Department of Commerce
National Technical Information Service
NTIS

EPA 570/9-82-006

PB83-180539

FINAL

DESCRIPTIVE SUMMARY

SURVEY OF OPERATING AND FINANCIAL CHARACTERISTICS OF COMMUNITY WATER SYSTEMS

Prepared for:

OFFICE OF DRINKING WATER, EPA

Prepared by:

TEMPLE, BARKER & SLOANE, INC.
33 HAYDEN AVENUE
LEXINGTON, MASSACHUSETTS 02173

October 7, 1982

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA 570/9-82-006		PB83 180539

4. TITLE AND SUBTITLE	5. REPORT DATE
Descriptive Summary: Survey of Operating and Financial Characteristics of Community Water Systems	October 7, 1983
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Temple, Barker & Sloane, Inc.	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Temple, Barker & Sloane, Inc. 33 Hayden Avenue Lexington, MA 02173	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO. 68-01-6454
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency Office of Drinking Water (WH-550) 401 M Street SW Washington, DC	13. TYPE OF REPORT AND PERIOD COVERED
	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

During the first six months of 1982, the Office of Drinking Water of the Environmental Protection Agency carried out a survey of the financial and operating characteristics of community water systems. The survey was a follow-up to a similar survey conducted in 1976 (covering 1975 data) and had the following objectives: (1) Provide updated description of water utility industry; (2) Provide improved (more current and, therefore, more exact) basis for assessing impacts of regulations; (3) Document changes and identify trends in industry since 1975 (to be used for new industry baseline projections); (4) Improve information gained in 1976 survey; and (5) Provide general statistics and general reference data for use by interested public.

A random sample stratified on the basis of the system size & ownership was selected. Twelve size categories based on population served were used. The following four ownerships were chosen as the basis of stratification: Public, Private, Ancillary and Native American.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
community water systems water supply drinking water financial characteristics operating characteristics		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
open	Non-Sensitive	163
	20. SECURITY CLASS *(This page)*	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

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DISCLAIMER

Although the research contained herein has been funded wholly or in part by the U.S. Environmental Protection Agency under contract 68-01-6454 to Temple, Barker and Sloane, Inc., it has not been subjected to the Agency's required peer and policy review and therefore does not necessarily reflect the views of the Agency and no official endorsement should be inferred.

I. BACKGROUND AND HIGHLIGHTS

BACKGROUND AND HIGHLIGHTS

During the first six months of 1982, the Office of Drinking Water of the Environmental Protection Agency carried out a survey (OMB No. 2000-0389) of the financial and operating characteristics of community water systems. The survey was a follow-up to a similar survey conducted in 1976 (covering 1975 data) and had the following objectives:

- Provide updated description of water utility industry
- Provide improved (more current and, therefore, more exact) basis for assessing impacts of regulations
- Document changes and identify trends in industry since 1975 (to be used for new industry baseline projections)
- Improve information gained in 1976 survey
- Provide general statistics and general reference data for use by interested public.

A random sample stratified on the basis of the system size and ownership was selected. Twelve size categories based on population served were used. The following four ownerships were chosen as the basis of stratification:

- Public: owned by state, local, or federal government
- Private: owned by homeowners associations, investors, or a parent company
- Ancillary: private systems whose primary business is other than the purveyance of water (the water system exists only as necessary support to the primary business)
- Native American: systems serving Native American populations

The stratified random samples were selected from the Federal Reporting Data Systems (FRDS). Alternate systems were chosen to accommodate the phenomenon of refusals, ineligible systems, or systems which could not be reached. Examples of ineligible systems are systems with a service population of less than 25 and active connections less than 15, systems which had merged with other systems and were no longer independent entities, and systems which did not provide drinking water. In the smallest size categories, despite attempts to reach over 150 systems in each cell, the goal of 50 systems was not reached. In some of the larger size cells there are not 50 systems in the universe. The final sample is shown below:

SURVEY SAMPLE

	POPULATION CATEGORY												
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000	Total
Public	35	50	50	50	50	50	50	50	50	50	20	14	519
Private	34	50	50	50	50	50	40	20	9	26	7	1	387
Ancillary	50	50	-	-	-	-	-	-	-	-	-	-	100
Total	119	150	100	100	100	100	90	70	59	76	27	15	1,006
Plus 50 Native Americans													1,056

This section shows selected highlights of the major findings of the analysis of the survey data. These data are generally shown as means. The supporting sections of this document contain more detail on these items and related issues.

Most of the data items are reported along ownership variables and then generalized to the total population of water systems. All financial characteristics, except rate structure, are reported for public and private systems only. Whenever data for ancillary systems is available, it is reported separately; it is never included within the private system category. Certain operating and financial characteristics are also reported according to water source types. Unless specifically defined otherwise in each table, these water source types are defined as follows:

- Predominantly Surface Water: More than fifty percent of a system's water production comes from surface water sources.

- Predominantly Ground Water: More than fifty percent of a system's water production comes from ground water sources.

- Other: More than fifty percent of a system's water production comes from purchased water, or no water source makes up more than fifty percent of a system's water production.

A great deal of effort was devoted to "cleaning" the data. Over twenty computerized checks for arithmetic errors were carried out and extreme values on each item were investigated. As a result, many arithmetic errors were corrected and numerous respondents were called back for clarification. Even with these efforts, the standard deviations on many of the items examined are large relative to the mean. This is due to the valid characteristics of the underlying population. The attempt to show in the body of this report medians, standard deviations, and the number of observations on most items is an acknowledgement of this characteristic and serves to provide the reader with more useful results.

MEAN SELECTED OPERATING CHARACTERISTICS

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
Ownership	Ancillary	Public	Public	Public	Public	Public	Public	Public	Public	Public	Public	Public
Primary Water Source[1]	Ground	Ground	Ground	Ground	Ground	Ground	Ground	Surface	Surface	Surface	Surface	Surface
Average Daily Production (MGD)[2]	0.013	0.037	0.093	0.200	0.952	2.753	6.065	11.680	15.912	36.806	129.421	517.491
Residential Deliveries Per Capita Per Day[3] (gallons)	94.8	91.4	74.0	74.6	84.1	82.3	80.1	86.1	86.9	85.0	86.8	58.7
Treatments Used By Over 50% of the Systems[4] (of those who treat at all)	None	None	-Liquid/ Gas Chlorine	-Liquid/ Gas Chlorine	-Liquid/ Gas Chlorine	-Liquid/ Gas Chlorine	-Liquid/ Gas Chlorine -Fluoride Addition -Conventional Plant	-Liquid/ Gas Chlorine -Conventional Plant -Fluoride Addition -Corrosion Control	-Liquid/ Gas Chlorine -Conventional Plant -Fluoride Addition	-Liquid/ Gas Chlorine -Conventional Plant -Fluoride Addition -Corrosion Control	-Liquid/ Gas Chlorine -Conventional Plant -Fluoride Addition -Corrosion Control -PAC	-Liquid/ Gas Chlorine -Conventional Plant -Fluoride Addition -Corrosion Control -PAC

[1]Primary Water Source is defined as the water source for 50 percent or more of a system's production.
[2]Average Daily Production is defined as reported annual production divided by 365 days.
[3]Residential Deliveries Per Capita Per Day is defined as reported residential deliveries divided by population served.
[4]For those systems that treat their water, these treatments are used by over half the systems.

MEAN SELECTED FINANCIAL CHARACTERISTICS

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
Total Water Operation Revenues (000$)[1]	$5.0	$16.2	$26.5	$77.1	$264.1	$773.6	$1,661.9	$2,819.9	$4,096.9	$8,673.3	$30,436.2	$90,866.1
Revenues/Deliveries[2] (¢/000 gallons)	190.4¢	171.5¢	150.0¢	122.4¢	106.2¢	85.7¢	94.2¢	82.1¢	76.5¢	77.5¢	73.0¢	55.9¢
Total Operating Expenses[3] (¢/000 gallons)	194.8¢	175.6¢	133.5¢	109.1¢	89.1¢	64.0¢	67.5¢	63.3¢	59.5¢	50.2¢	44.7¢	38.8¢
Total Net Assets[4] (000$)	$37.8	$202.8	$299.8	$775.9	$1,915.8	$5,450.5	$9,996.7	$27,021.9	$24,105.6	$54,337.5	$193,413.4	$540,735.6
Gross Assets/Production[5] ($/gallon)	$5.5	$9.0	$4.0	$4.0	$3.2	$1.9	$2.5	$2.0	$1.5	$1.6	$1.4	$1.4
Percent with Long-Term Debt[6]	24%	45%	61%	67%	75%	81%	82%	88%	90%	90%	100%	100%

[1]Water Operation Revenues is defined as revenues derived from the sale of water or new hookups; only systems that charge for water are included in this figure.
[2]Revenues/Deliveries is defined as water operation revenues per 1,000 gallons of water delivered annually.
[3]Operating Expenses include Operating and Maintenance Expense, Depreciation Expense, and Other Operating Costs. It does not include Interest Expense or Taxes.
[4]Total Net Assets includes Current Assets, Net Plant and Equipment, and Other Assets.
[5]Gross Assets/Production is defined as Gross Plant and Equipment/Average Daily Production.
[6]Long-Term Debt is defined as debt with more than one year to maturity.

This document presents the analysis of the survey results. The raw survey data are also available from EPA for further analysis. The structure of the document is outlined below:

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- II.2 Water Source Profile

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II. GENERAL CHARACTERISTICS

II.1 OWNERSHIP AND CUSTOMER PROFILE

II.2 WATER SOURCE PROFILE

II.1 OWNERSHIP AND CUSTOMER PROFILE

OWNERSHIP STRUCTURE

WITHIN THE THREE MAJOR CATEGORIES OF OWNERSHIP, THE STRUCTURE VARIES GREATLY. PUBLIC SYSTEMS ALTHOUGH PREDOMINANTLY OWNED BY THE LOCAL MUNICIPAL GOVERNMENT ALSO REPORT A SIGNIFICANT PORTION OF SYSTEMS OWNED BY THE FEDERAL GOVERNMENT. WHOLESALERS (SYSTEMS THAT SELL ONLY TO WHOLESALE CUSTOMERS) ARE A MAJOR OWNERSHIP STRUCTURE OF VERY LARGE SYSTEMS. PRIVATE SYSTEMS ARE TYPICALLY INVESTOR-OWNED IN THE LARGER SIZE CATEGORIES, BUT ARE MORE TYPICALLY OWNED BY HOMEOWNERS ASSOCIATIONS IN THE SMALLEST CATEGORY AND BY PARENT COMPANIES IN THE MIDDLE SIZE CATEGORIES. ANCILLARY SYSTEMS ARE PRIVATELY OWNED SYSTEMS WHOSE PRIMARY BUSINESS IS OTHER THAN THE PURVEYANCE OF WATER. THE WATER SYSTEM EXISTS ONLY AS NECESSARY SUPPORT TO THE PRIMARY BUSINESS. ANCILLARY SYSTEMS WERE TREATED SEPARATELY ONLY IN THE TWO SMALLEST SIZE CATEGORIES. THE VAST MAJORITY OF THESE SYSTEMS ARE MOBILE HOME PARKS. MANY OF THOSE IN THE "OTHER" CATEGORY ARE NURSING HOMES.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
PUBLIC												
Ownership Structure												
Local municipal government	91.4%	92.0%	98.0%	100.0%	96.0%	94.0%	100.0%	98.0%	98.0%	96.0%	90.0%	71.4%
Federal government	8.6	8.0	2.0	0.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesalers	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	2.0	4.0	10.0	28.6
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
(Obs.)	(35)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(20)	(14)
PRIVATE												
Ownership Structure												
Investor-owned	35.3%	48.0%	56.0%	60.0%	48.0%	40.0%	45.0%	60.0%	55.6%	69.2%	85.7%	100.0%
Homeowners association or subdivision	41.2	28.0	16.0	16.0	14.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
Parent company	8.8	18.0	6.0	8.0	24.0	46.0	52.5	30.0	33.3	30.8	14.3	0.0
Wholesalers	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0
Other	14.7	6.0	22.0	16.0	14.0	4.0	0.0	10.0	11.1	0.0	0.0	0.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
(Obs.)	(34)	(50)	(50)	(50)	(50)	(50)	(40)	(20)	(9)	(26)	(7)	(1)
ANCILLARY												
Ownership Structure												
Mobile home park	74.0%	74.0%	-	-	-	-	-	-	-	-	-	-
Hospital	2.0	0.0	-	-	-	-	-	-	-	-	-	-
School	0.0	4.0	-	-	-	-	-	-	-	-	-	-
Institution	8.0	2.0	-	-	-	-	-	-	-	-	-	-
Other	16.0	20.0	-	-	-	-	-	-	-	-	-	-
Total	100.0%	100.0%	-	-	-	-	-	-	-	-	-	-
(Obs.)	(50)	(50)	-	-	-	-	-	-	-	-	-	-

OWNERSHIP STRUCTURE--NATIONAL TOTALS

(number of systems in U.S.)

IN ADDITION TO THE EXPECTED OWNERSHIP PATTERNS BETWEEN PUBLIC AND PRIVATELY OWNED SYSTEMS, THERE ARE OVER 12,000 MOBILE HOME PARKS AND NEARLY 5,000 HOMEOWNERS ASSOCIATION/SUBDIVISIONS.

	POPULATION CATEGORY												
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000	Total
						PUBLIC							
Ownership Structure													
Local municipal government	1,512	6,696	4,915	6,529	3,316	994	944	178	80	187	18	10	25,379
Federal government	142	582	100	0	138	42	0	0	0	0	0	0	1,004
Wholesalers	0	0	0	0	0	21	0	4	2	8	2	4	41
Total	1,654	7,278	5,015	6,529	3,454	1,057	944	182	82	195	20	14	26,424
						PRIVATE							
Ownership Structure													
Investor-owned	2,716	2,351	658	638	190	74	99	25	11	26	7	1	6,796
Homeowners association or subdivision	3,170	1,371	188	170	56	19	0	0	0	0	0	0	4,974
Parent company	677	882	71	85	95	86	115	13	6	12	1	0	2,043
Wholesalers	0	0	0	0	0	0	5	0	0	0	0	0	5
Other	1,130	294	259	170	56	7	0	4	2	0	0	0	1,922
Total	7,693	4,898	1,176	1,063	397	186	219	42	19	38	8	1	15,740
						ANCILLARY							
Ownership Structure													
Mobile home park	8,306	4,125	-	-	-	-	-	-	-	-	-	-	12,511
Hospital	227	0	-	-	-	-	-	-	-	-	-	-	227
School	0	223	-	-	-	-	-	-	-	-	-	-	223
Institution	907	111	-	-	-	-	-	-	-	-	-	-	1,018
Other	1,813	1,115	-	-	-	-	-	-	-	-	-	-	2,928
Total	11,333	5,574	-	-	-	-	-	-	-	-	-	-	16,907
GRAND TOTAL	20,680	17,750	6,191	7,592	3,851	1,243	1,163	224	101	233	28	15	59,071

NOTE: National totals calculated by applying survey results for ownership structure to most recent Federal Reporting Data Systems (FRDS) estimates for each population category.

AVERAGE POPULATION SIZE BY OWNERSHIP

(number of people)

AMONG THE SMALLEST SIZE CATEGORIES, PUBLIC SYSTEMS ARE ON AVERAGE LARGER THAN PRIVATELY OWNED SYSTEMS WHILE THE OPPOSITE RELATIONSHIP EXISTS AMONG THE LARGER SYSTEMS. IN ADDITION, ANCILLARY SYSTEMS ARE EVEN SMALLER THAN PRIVATELY OWNED SYSTEMS. AMONG THE MEDIUM-SIZE CATEGORIES, THERE ARE NO SIGNIFICANT DIFFERENCES ACROSS OWNERSHIP TYPES.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS												
Population Served[1]												
Mean	56.5	244.7	782.4	1,818.6	5,765.0	16,935.4	37,157.1	62,829.7	88,035.4	209,949.6	706,829.9	2,342,736
S.D.	26.0	525.0	145.3	675.4	1,998.0	4,245.7	7,914.8	61,413.4	87,137.6	103,861.4	130,883.7	1,784,363
PUBLIC												
Population Served[1]												
Mean	66.5	287.1	787.8	1,799.1	5,714.8	16,931.8	37,178.1	62,803.5	88,221.1	209,754.0	702,107.0	2,430,596
Median	61.0	252.0	800.0	1,495.0	5,000.0	15,176.0	37,500.0	61,623.0	87,373.0	160,000.0	659,897.0	1,600,000
S.D.	23.9	131.5	140.5	685.0	2,000.2	4,197.4	7,949.9	7,256.0	8,652.5	105,269.0	142,438.0	1,843,374
(Obs.)	(35)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(20)	(13)
PRIVATE												
Population Served[1]												
Mean	61.2	240.0	759.4	1,938.4	6,202.0	16,955.9	37,066.6	62,943.0	87,211.8	210,954.0	718,337.0	1,036,000
Median	60.0	206.0	750.0	2,000.0	6,000.0	16,850.0	35,000.0	60,500.0	86,086.0	194,281.0	703,500.0	1,036,000
S.D.	27.6	982.9	163.9	612.9	1,979.0	4,509.9	7,761.5	6,381.2	6,307.0	96,310.0	97,140.1	0.0
(Obs.)	(33)	(49)	(50)	(50)	(50)	(50)	(40)	(20)	(9)	(26)	(9)	(1)
ANCILLARY												
Population Served[1]												
Mean	51.8	193.5	-	-	-	-	-	-	-	-	-	-
Median	50.0	159.0	-	-	-	-	-	-	-	-	-	-
S.D.	25.0	76.9	-	-	-	-	-	-	-	-	-	-
(Obs.)	(50)	(50)	-	-	-	-	-	-	-	-	-	-

[1]Population served refers to permanent residential population.

PUBLIC SYSTEM CONNECTION PROFILE

THE PORTION OF TOTAL CONNECTIONS THAT IS ASSOCIATED WITH RESIDENTIAL CUSTOMERS IS RELATIVELY STABLE IN THE 83-88 PERCENT RANGE EXCEPT FOR THE TWO SMALLEST CATEGORIES, WHERE RESIDENTIAL CONNECTIONS ACCOUNT FOR A SMALLER SHARE OF TOTAL CONNECTIONS. THE PERCENTAGE RELATED TO COMMERCIAL/INDUSTRIAL CONNECTIONS IS GENERALLY IN THE 7-10 PERCENT RANGE, WHILE FIRE CONNECTIONS BECOME LOWER WITH INCREASING SYSTEM SIZE.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
Total Connections												
Mean	31.4	146.3	318.6	707.5	1,901.0	5,700.0	10,560.3	17,908.1	24,389.3	55,490.7	164,547.0	455,475.0
Median	25.5	115.0	294.0	620.0	1,628.0	5,431.0	10,580.0	18,144.0	24,131.0	49,700.0	177,286.0	374,200.0
S.D.	18.8	103.0	116.9	313.1	735.6	1,814.7	2,824.6	4,143.1	5,277.5	29,797.6	55,851.0	198,473.0
(Obs.)	(24)	(44)	(49)	(48)	(47)	(48)	(49)	(49)	(49)	(47)	(18)	(9)
Connection Breakdown												
Residential	78.4%	78.1%	84.4%	83.5%	83.7%	82.6%	89.0%	87.5%	88.8%	86.2%	87.2%	85.9%
Commercial/Indus.	3.2	4.9	6.5	10.1	9.4	9.1	7.4	7.7	7.6	10.6	8.6	11.3
Wholesale	0.0	0.2	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.2	0.0	0.0
Other	9.5	6.2	0.9	0.6	0.9	2.8	0.5	0.4	0.6	0.3	0.4	1.8
Fire	8.9	10.6	8.2	5.8	6.0	5.0	3.1	4.4	2.4	2.7	3.8	1.0
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(21)	(46)	(48)	(45)	(42)	(42)	(35)	(32)	(36)	(35)	(13)	(5)

Note: Calculations exclude wholesalers and other special situations such as schools, prisons.

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CONNECTION PROFILE BY OWNERSHIP

CONSISTENT WITH THEIR SMALLER SERVICE POPULATIONS, PRIVATE AND ANCILLARY SYSTEMS HAVE FEWER CONNECTIONS THAN DO PUBLIC SYSTEMS. PRIVATE AND ANCILLARY SYSTEMS HAVE A HIGHER PERCENTAGE OF RESIDENTIAL CUSTOMERS.

PRIVATE SYSTEMS

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Total Connections (number)												
Mean	35.6	110.2	273.0	625.2	1,840.4	4,817.1	13,309.4	16,835.6	24,372.2	58,274.2	181,311.0	346,130.0
Median	28.5	78.0	229.0	631.0	1,686.0	4,697.0	12,090.0	16,627.0	24,951.0	57,755.0	182,078.0	346,130.0
S.D.	27.2	91.0	161.1	276.6	789.0	2,144.3	4,597.0	3,662.5	5,428.5	23,043.7	47,984.4	0.0
(Obs.)	(30)	(40)	(46)	(45)	(38)	(27)	(18)	(14)	(6)	(18)	(6)	(1)
Connection Breakdown (%)												
Residential	90.5%	95.9%	95.2%	92.5%	91.5%	89.4%	86.2%	88.6%	90.3%	90.1%	91.8%	69.1%
Commercial/Indus.	1.1	1.4	2.0	2.9	5.3	6.6	8.2	6.9	7.3	8.1	7.1	3.8
Wholesale	0.0	0.0	0.0	0.0	0.0	0.5	1.1	0.0	0.0	0.0	0.0	0.0
Other	1.8	0.3	0.4	1.1	0.6	0.6	1.9	0.7	0.6	0.4	0.2	0.9
Fire	6.6	2.4	2.4	3.5	2.6	2.9	2.6	3.9	1.8	1.4	0.9	26.2
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(31)	(48)	(46)	(49)	(46)	(47)	(35)	(18)	(5)	(24)	(4)	(1)

ANCILLARY SYSTEMS

	Population Category	
	25-100	101-500
Total Connections (number)		
Mean	31.8	78.3
Median	26.0	67.0
S.D.	25.0	49.6
(Obs.)	(46)	(46)
Connection Breakdown (%)		
Residential	89.6%	90.7%
Commercial/Indus.	1.0	0.4
Wholesale	0.0	0.0
Other	3.4	5.2
Fire	6.1	3.7
Total	100%	100%
(Obs.)	(49)	(49)

Note: Private calculations exclude wholesalers and other special situations.

ANCILLARY SYSTEM GENERAL CHARACTERISTICS

THE VAST MAJORITY OF ANCILLARY SYSTEMS HAVE ONLY SMALL PORTIONS OF THEIR POPULATIONS THAT CAN BE CONSIDERED VERY YOUNG OR OLD. SOME SYSTEMS, HOWEVER (NOTABLY SCHOOLS AND NURSING HOMES), SHOW 100% OF THEIR POPULATION AS BEING IN EITHER OF THESE EXTREMES. THESE DATA HAVE PARTICULAR RELEVANCE WHEN CONSIDERING THE IMPACT OF CONTAMINANTS WITH CHRONIC VERSUS ACUTE HEALTH EFFECTS.

POPULATION PROFILE

Portion of Population Less Than 10 Years Old	Population Category 25-100	101-501
None	30.6%	29.2%
0-10%	46.9	39.6
11-20%	14.3	12.5
21-30%	2.0	12.5
31-40%	2.0	0.0
41-50%	2.0	0.0
51-60%	0.0	0.0
61-70%	0.0	0.0
71-80%	2.0	2.1
81-90%	0.0	2.1
91-99%	0.0	0.0
100%	0.0	2.1
	100%	100%
(Obs.)	(49)	(48)
% Don't Know	2.0%	4.0%

POPULATION PROFILE

Portion of Population More Than 60 Years Old	Population Category 25-100	101-501
None	10.2%	24.0%
0-10%	46.9	34.0
11-20%	10.2	8.0
21-30%	10.2	10.0
31-40%	0.0	2.0
41-50%	6.1	2.0
51-60%	2.0	6.0
61-70%	2.0	0.0
71-80%	2.0	2.0
81-90%	2.0	4.0
91-99%	0.0	4.0
100%	8.2	4.0
	100%	100%
(Obs.)	(49)	(50)
% Don't Know	2.0%	0.0%

MOST ANCILLARY SYSTEMS REPORT THAT THEIR CUSTOMERS TYPICALLY REMAIN IN THEIR TERRITORY FOR MORE THAN TWO YEARS.

SERVICE DURATION

Typical Length of Service	Population Category 25-100	101-500
Less than 2 years	14.0%	14.0%
2 to 5 years	46.0	40.0
Over 5 years	38.0	46.0
(Obs.)	(49)	(50)

II.2 WATER SOURCE PROFILE

WATER SOURCE FOR ALL SYSTEMS

SYSTEMS SERVING FEWER THAN 10,000 PEOPLE TEND TO RELY ON GROUND WATER ALONE AS THEIR SOURCE OF WATER. IN THE LARGER SIZES SURFACE WATER IS OF INCREASING IMPORTANCE, WITH 100% SURFACE WATER DOMINATING AS THE WATER SOURCE OF THE LARGEST SYSTEMS.

	POPULATION CATEGORY											
Water Source	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
100% Surface[1]	5.0%	5.0%	6.0%	11.8%	25.7%	26.2%	26.7%	35.3%	31.5%	35.6%	36.1%	71.2%
Mostly Surface[2]	0.0	0.0	1.7	4.6	0.7	6.1	7.8	15.1	7.5	19.4	34.3	14.4
100% Ground[3]	92.2	85.8	85.5	68.7	51.4	42.2	39.5	14.9	17.0	22.2	10,4	0.0
Mostly Ground[4]	1.3	0.9	4.3	0.6	11.7	11.2	7.4	8.5	10.0	9.8	8.3	7.2
100% Purchased[5]	3.5	8.3	2.5	14.0	6.4	13.4	13.7	16.7	18.4	5.7	3.5	7.2
Mostly Purchased[6]	0.0	0.0	0.0	0.3	3.7	0.9	4.9	7.6	14.0	5.0	3.5	0.0
Mixed[7]	0.0	0.0	0.0	0.0	0.4	0.0	0.0	1.9	1.6	2.3	3.5	0.0
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

[1]100% surface covers systems which produce all their water from surface water sources.
[2]Mostly surface covers systems which produce 50-99% of their water from surface water sources.
[3]100% ground covers systems which produce all their water from ground water sources.
[4]Mostly ground covers systems which produce 50-99% of their water from ground water sources.
[5]100% purchased covers systems which purchase all their water.
[6]Mostly purchased covers systems which purchase 50-99% of their water.
[7]Mixed covers systems which do not produce 50% or more of their water from any one source.

WATER SOURCE BY OWNERSHIP

THE DATA SHOW THAT PUBLIC SYSTEMS ARE GENERALLY MORE LIKELY TO USE 100 PERCENT SURFACE WATER THAN ARE PRIVATELY-OWNED SYSTEMS (WHICH ARE MORE LIKELY TO USE 100 PERCENT GROUND WATER). WHEN "100% SURFACE WATER" AND "MOSTLY SURFACE WATER" ARE COMBINED, HOWEVER, THE RELATIONSHIP CHANGES, WITH PUBLIC SYSTEMS STILL SLIGHTLY MORE LIKELY THAN PRIVATELY OWNED SYSTEMS TO USE SURFACE WATER, BUT THE RELATIONSHIP IS INCONSISTENT IN THE MID SIZES AND TOTALLY REVERSED IN THE LARGER SIZES.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
PUBLIC												
Water Source												
100% surface	6.3%	10.9%	6.4%	13.1%	26.5%	20.6%	20.6%	50.0%	20.6%	30.0%	45.0%	69.2%
Mostly surface	0.0	0.0	2.1	4.3	0.0	6.1	4.1	16.3	4.1	10.0	25.0	15.4
100% ground	81.2	69.5	85.1	67.4	51.0	40.0	30.0	10.2	18.4	22.0	15.0	0.0
Mostly ground	0.0	2.2	4.3	0.0	12.5	10.2	6.1	8.2	12.2	8.0	0.0	7.7
100% purchased	12.5	17.4	2.1	15.2	6.1	14.3	16.3	10.3	22.5	6.0	5.0	7.7
Mostly purchased	0.0	0.0	0.0	0.0	4.1	0.0	6.1	8.2	12.2	6.0	5.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	5.0	0.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
No. of observations	(32)	(46)	(47)	(46)	(49)	(49)	(49)	(49)	(49)	(50)	(20)	(13)
PRIVATE												
Water Source												
100% surface	3.3%	2.1%	4.3%	4.2%	19.1%	12.5%	18.4%	20.0%	44.5%	23.1%	14.3%	100.0%
Mostly surface	0.0	0.0	0.0	6.4	6.4	6.3	23.7	10.0	22.2	26.9	57.1	0.0
100% ground	90.0	93.8	87.3	76.7	55.3	50.0	42.1	35.0	11.1	23.1	0.0	0.0
Mostly ground	0.0	0.0	4.2	4.3	6.4	16.7	13.2	10.0	0.0	19.3	28.6	0.0
100% purchased	6.7	4.1	4.2	6.4	8.5	8.3	2.6	10.0	0.0	3.8	0.0	0.0
Mostly purchased	0.0	0.0	0.0	2.0	0.0	6.3	0.0	5.0	22.2	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	4.3	0.0	0.0	10.0	0.0	3.8	0.0	0.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
No. of observations	(30)	(48)	(47)	(47)	(47)	(48)	(38)	(20)	(9)	(26)	(7)	(1)
ANCILLARY												
Water Source												
100% surface	2.4%	0.0%	-	-	-	-	-	-	-	-	-	-
Mostly surface	0.0	0.0	-	-	-	-	-	-	-	-	-	-
100% ground	95.2	100.0	-	-	-	-	-	-	-	-	-	-
Mostly ground	2.4	0.0	-	-	-	-	-	-	-	-	-	-
100% purchased	0.0	0.0	-	-	-	-	-	-	-	-	-	-
Mostly purchased	0.0	0.0	-	-	-	-	-	-	-	-	-	-
Other	0.0	0.0	-	-	-	-	-	-	-	-	-	-
Total	100.0%	100.0%	-	-	-	-	-	-	-	-	-	-
No. of observations	(41)	(42)										

NUMBER OF WATER SOURCES

NO UNUSUAL PATTERNS EMERGE IN THE ANALYSIS OF NUMBER OF WATER SOURCES. THE LARGE DIFFERENCES BETWEEN THE MEAN AND MEDIAN NUMBER OF WELLS FOR SURFACE WATER SYSTEMS INDICATE A FEW SYSTEMS WITH MANY WELLS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
PREDOMINANTLY SURFACE WATER[1]												
Number of Wells												
Mean	0.8	0.0	0.5	1.5	0.1	0.7	3.7	2.9	0.8	4.3	17.5	9.8
Median	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(Obs.)	(4)	(6)	(6)	(13)	(25)	(26)	(32)	(32)	(22)	(41)	(19)	(12)
Number of Upstream Sources												
Mean	0.8	0.8	1.2	1.7	2.4	2.7	2.6	2.5	2.0	4.5	3.7	3.9
Median	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	2.0	3.0	2.0
(Obs.)	(4)	(6)	(6)	(13)	(25)	(26)	(30)	(33)	(22)	(40)	(19)	(12)
PREDOMINANTLY GROUND WATER[2]												
Number of Wells												
Mean	1.6	2.1	2.8	4.5	8.1	8.6	13.4	16.7	17.9	56.2	128.4	206.0
Median	1.0	2.0	2.0	3.0	4.0	6.5	8.0	14.0	17.0	42.0	151.0	206.0
(Obs.)	(93	(120)	(85)	(69)	(60)	(56)	(43)	(18)	(16)	(26)	(5)	(1)
Number of Upstream Sources												
Mean	0.1	0.1	0.1	0.0	0.2	0.4	0.3	0.0	0.4	0.5	2.6	3.0
Median	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
(Obs.)	(92)	(118)	(84)	(68)	(58)	(56)	(42)	(18)	(16)	(26)	(5)	(1)
OTHER[3]												
Number of Wells												
Mean	0.0	0.6	0.0	0.2	1.0	0.5	0.8	4.4	5.9	5.4	1.3	0.0
Median	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	1.0	0.0
(Obs.)	(6)	(10)	(3)	(11)	(11)	(14)	(12)	(18)	(19)	(9)	(3)	(1)
Number of Upstream Sources												
Mean	0.2	0.3	0.0	0.9	0.8	1.1	1.1	0.9	1.3	1.9	5.0	2.0
Median	0.0	0.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	2.0	5.0	2.0
(Obs.)	(6)	(9)	(3)	(10)	(11)	(12)	(9)	(18)	(19)	(9)	(2)	(1)

[1]Predominantly Surface Water covers systems which produce 50% or more of their water from surface water sources.
[2]Predominantly Ground Water covers systems which produce 50% or more of their water from ground water sources.
[3]Other covers systems which purchase 50% or more of their water, or have mixed water sources, none of which exceed 50%.

WELLS IN PREDOMINANTLY GROUND WATER SYSTEMS

THE NUMBER OF WELLS IN GROUND WATER SYSTEMS IS GENERALLY SMALL FOR SMALL SYSTEMS RISING TO A SIGNIFICANT NUMBER FOR LARGER SYSTEMS. ALSO, THERE APPEAR TO BE A SMALL NUMBER OF SEPARATE GROUPS OF WELLS IN MOST SYSTEMS. THE DISTANCE BETWEEN THESE GROUPS OF WELLS IS OFTEN OVER FIVE MILES WITH THE DISTANCE GENERALLY INCREASING WITH INCREASING SYSTEM SIZE.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Number of Wells												
Mean	1.6	2.1	2.8	4.5	8.1	8.6	13.4	16.7	17.9	56.2	120.4	206.0
Groups of Wells												
Mean	0.8	0.9	1.3	2.2	2.1	2.1	2.6	7.4	5.5	14.8	38.8	0.0
Median	0.0	0.0	1.0	0.0	0.5	2.0	2.0	4.0	3.0	7.0	40.0	0.0
(Obs.)	(9)	(17)	(35)	(35)	(48)	(46)	(35)	(17)	(13)	(26)	(5)	(1)
Closest Distance[1] (Percent of Systems)												
Up to 1/2 mile	85.7%	70.6%	63.3%	69.0%	55.6%	67.6%	59.4%	75.0%	75.0%	52.4%	40.0%	100.0%
1/2 - 2 miles	14.3	11.8	26.7	24.1	27.8	21.6	15.6	18.8	8.4	33.3	20.0	0.0
2-5 miles	0.0	11.8	10.0	6.9	13.8	10.8	21.9	6.2	8.3	0.0	20.0	0.0
Over 5 miles	0.0	5.8	0.0	0.0	2.8	0.0	3.1	0.0	8.3	14.3	20.0	0.0
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(7)	(17)	(30)	(29)	(36)	(37)	(32)	(16)	(12)	(21)	(5)	(1)
Farthest Distance[2] (Percent of Systems)												
Up to 1/2 mile	0.0%	16.7%	10.0%	4.3%	4.2%	5.2%	8.0%	6.6%	0.0%	0.0%	0.0%	0.0%
1/2 - 2 miles	50.0	66.6	50.0	52.2	45.8	29.0	12.0	26.7	18.2	11.1	0.0	0.0
2 - 5 miles	50.0	0.0	20.0	17.4	45.8	45.2	56.0	26.7	27.3	16.7	0.0	0.0
Over 5 miles	0.0	16.7	20.0	26.1	4.2	22.6	24.0	40.0	54.5	72.2	100.0	100.0
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(2)	(6)	(20)	(23)	(24)	(31)	(25)	(15)	(11)	(18)	(5)	(1)

[1]Closest distance is defined as the closest distance between two groups of wells.
[2]Farthest distance is defined as the farthest distance between two groups of wells.

III. OPERATING CHARACTERISTICS

III.1 PRODUCTION/DELIVERY DATA

III.2 TREATMENT PROFILE

III.3 DISTRIBUTION SYSTEM PROFILE

III.1 PRODUCTION/DELIVERY DATA

AVERAGE DAILY PRODUCTION

(MGD)

SURFACE WATER SYSTEMS GENERALLY PRODUCE MORE WATER THAN DO GROUND WATER SYSTEMS. THIS RELATIONSHIP IS STRONGEST FOR THOSE SYSTEMS SERVING FEWER THAN 50,001 PEOPLE (BASED ON EXAMINATION OF THE MEDIANS). ALSO, "OTHER" (LARGELY SYSTEMS RELYING ON PURCHASED WATER) HAVE THE LOWEST AVERAGE DAILY PRODUCTION BELOW THAT SIZE.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
						ALL SYSTEMS						
Average Daily Production[1]												
Mean	0.013	0.037	0.093	0.280	0.952	2.753	6.065	11.680	15.912	36.806	129.421	517.491
S.D.	0.038	0.118	0.159	0.364	0.761	1.569	3.553	8.742	5.555	19.841	48.490	435.980
						PREDOMINANTLY SURFACE WATER						
Average Daily Production[1]												
Mean	0.019	0.128	0.205	0.267	1.120	2.980	5.597	11.869	15.804	40.949	129.306	558.596
Median	0.013	0.124	0.160	0.201	0.822	2.808	5.480	10.017	14.969	32.110	119.258	347.849
S.D.	0.014	0.106	0.210	0.203	0.795	1.320	2.011	9.866	4.859	23.364	56.011	471.139
(Obs.)	(4)	(4)	(6)	(13)	(25)	(25)	(32)	(33)	(22)	(41)	(19)	(12)
						PREDOMINANTLY GROUND WATER						
Average Daily Production[1]												
Mean	0.013	0.030	0.085	0.300	0.933	2.822	6.449	11.025	15.586	31.630	123.070	366.875
Median	0.004	0.021	0.063	0.209	0.758	2.144	4.633	10.760	15.578	27.884	121.423	366.875
S.D.	0.034	0.032	0.072	0.371	0.671	1.709	4.481	4.367	4.424	14.485	24.873	0.0
(Obs.)	(53)	(95)	(74)	(63)	(59)	(57)	(42)	(18)	(16)	(26)	(5)	(1)
						OTHER						
Average Daily Production[1]												
Mean	0.007	0.055	0.042	0.199	0.647	1.981	5.964	11.900	16.295	32.022	141.564	179.419
Median	0.007	0.037	0.052	0.182	0.516	1.870	4.985	10.674	15.379	29.330	134.325	179.419
S.D.	0.004	0.067	0.019	0.140	0.618	0.915	2.792	9.285	6.883	12.933	14.598	0.000
(Obs.)	(6)	(10)	(3)	(9)	(11)	(14)	(12)	(18)	(20)	(9)	(3)	(1)

[1]Average daily production is defined as reported annual production for 1980 divided by 365 days.

MAXIMUM DAILY PRODUCTION BY OWNERSHIP

THERE ARE NO APPRECIABLE DIFFERENCES IN THE MAXIMUM DAILY PRODUCTION OR MAXIMUM/AVERAGE DAILY PRODUCTION FIGURES ACROSS OWNERSHIP TYPES. HOWEVER, WHEN MEASURED AGAINST SIZE, THE MAXIMUM/AVERAGE PRODUCTION FIGURE CONSISTENTLY DECREASES WITH LARGER SIZE CATEGORIES. THE SMALLEST SIZE SYSTEMS, ESPECIALLY ANCILLARY SYSTEMS, SHOW CONSIDERABLE VARIABILITY IN THE MAXIMUM/AVERAGE PRODUCTION FIGURE.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS												
Maximum Daily Production (MGD)[1]												
Mean	.032	0.8	.21	.55	2.12	6.15	10.62	19.09	25.4	58.7	202.1	752.9
S.D.	.100	.21	.29	.53	2.53	5.31	6.62	13.02	10.6	39.4	105.1	670.4
Maximum/Average Daily Production												
Mean	3.9	2.5	2.1	2.2	1.9	1.9	1.9	1.7	1.6	1.6	1.5	1.4
S.D.	5.7	2.4	1.9	1.5	1.0	1.0	1.6	0.48	0.40	.44	.45	.29
PUBLIC												
Maximum Daily Production (MGD)[1]												
Mean	.024	.12	.20	.54	2.18	6.55	10.68	19.7	26.9	59.2	229.7	785.1
S.D.	.020	.12	.16	.49	2.61	5.6	6.4	14.2	11.5	41.5	123.0	692.6
(Obs.)	(20)	(31)	(39)	(38)	(34)	(43)	(36)	(38)	(38)	(46)	(18)	(13)
Maximum/Average Daily Production												
Mean	2.8	2.7	1.9	2.1	1.92	2.0	2.0	1.7	1.6	1.6	1.6	1.4
S.D.	2.0	2.3	0.8	1.1	1.05	1.0	1.7	0.5	0.4	0.4	0.3	0.3
(Obs.)	(16)	(28)	(36)	(35)	(37)	(41)	(36)	(37)	(35)	(42)	(17)	(13)
PRIVATE												
Maximum Daily Production (MGD)[1]												
Mean	.023	.06	.26	.62	1.56	3.88	10.35	16.46	18.9	55.6	134.7	274.5
S.D.	.025	.06	.48	.61	1.39	2.36	7.44	5.35	4.0	28.3	31.4	0.0
(Obs.)	(13)	(24)	(29)	(32)	(39)	(44)	(34)	(18)	(7)	(24)	(6)	(1)
Maximum/Average Daily Production												
Mean	1.9	2.7	3.2	2.7	1.7	1.6	1.9	1.7	1.5	1.7	1.3	2.0
S.D.	0.6	2.5	3.9	2.6	0.7	0.4	.89	.36	.23	0.7	0.2	0.0
(Obs.)	(10)	(22)	(27)	(29)	(37)	(44)	(32)	(18)	(7)	(24)	(6)	(1)
ANCILLARY												
Maximum Daily Production (MGD)[1]												
Mean	.08	.06	-	-	-	-	-	-	-	-	-	-
S.D.	.05	.10	-	-	-	-	-	-	-	-	-	-
(Obs.)	(17)	(21)	-	-	-	-	-	-	-	-	-	-
Maximum/Average Daily Production												
Mean	5.5	2.1	-	-	-	-	-	-	-	-	-	-
S.D.	7.4	2.2	-	-	-	-	-	-	-	-	-	-
(Obs.)	(12)	(10)	-	-	-	-	-	-	-	-	-	-

[1]Maximum Daily Production means the maximum number of gallons (MGD) produced by a system in any one day in 1980.

DAILY PRODUCTION PER CAPITA BY OWNERSHIP

(gallons per person per day)

PRODUCTION PER CAPITA GENERALLY INCREASES WITH INCREASING SYSTEM SIZE. THE STANDARD DEVIATIONS OF THE DATA ARE LARGE RELATIVE TO THE MEAN ACROSS ALL SIZES. ALSO, PUBLIC SYSTEM PRODUCTION PER CAPITA IS GENERALLY HIGHER THAN FOR PRIVATELY OWNED SYSTEMS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS												
Daily Production per Capita[1]												
Mean	135.0	150.0	123.2	139.0	172.2	170.6	162.5	179.0	180.9	187.3	182.3	182.8
PUBLIC												
Daily Production per Capita[1]												
Mean	113.2	172.7	125.2	139.4	175.4	184.3	164.1	184.3	182.6	193.3	194.3	183.6
S.D.	90.2	167.9	92.4	82.7	111.6	93.1	77.4	131.3	55.4	78.7	56.4	39.2
Range	(19-377)	(20-752)	(16-415)	(33-788)	(50-604)	(63-499)	(22-390)	(57-940)	(89-295)	(81-449)	(106-304)	(112-236)
(Obs.)	(23)	(39)	(44)	(45)	(48)	(48)	(49)	(49)	(50)	(50)	(20)	(13)
PRIVATE												
Daily Production per Capita[1]												
Mean	129.7	84.3	114.7	136.0	144.6	146.4	155.4	158.7	173.1	156.3	153.1	132.9
S.D.	98.4	50.4	144.8	131.3	97.0	88.9	78.5	48.6	68.7	47.7	47.9	132.9
Range	(12-386)	(27-274)	(13-775)	(15-704)	(22-448)	(33-534)	(24-445)	(57-267)	(118-318)	(86-275)	(97-245)	0.0
(Obs.)	(22)	(41)	(39)	(40)	(47)	(50)	(38)	(20)	(9)	(26)	(7)	(1)
ANCILLARY												
Daily Production per Capita[1]												
Mean	142.5	177.0	-	-	-	-	-	-	-	-	-	-
S.D.	170.7	207.8	-	-	-	-	-	-	-	-	-	-
Range	(24-753)	(15-883)	-	-	-	-	-	-	-	-	-	-
(Obs.)												

[1]Daily production per capita is defined as reported annual production * 365/population served.

DAILY RESIDENTIAL DELIVERIES PER CAPITA BY OWNERSHIP

(gallons per person per day)

RESIDENTIAL DELIVERIES PER CAPITA RANGE FROM 70-90 GALLONS PER DAY AMONG SYSTEMS SERVING MORE THAN 10,000 PEOPLE; PUBLIC SYSTEMS APPEAR TO DELIVER MORE GALLONS PER PERSON THAN PRIVATELY OWNED SYSTEMS. NO DIFFERENCES EMERGE WHEN THE DATA ARE ANALYZED ALONG SIZE CATEGORIES.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS												
Residential Deliveries Per Capita												
Mean	94.8	91.4	74.0	74.6	84.1	82.3	80.1	86.1	86.9	85.0	86.8	58.7
S.D.	83.8	84.6	44.7	37.3	49.9	38.8	49.0	42.5	32.5	37.1	32.8	24.0
PUBLIC												
Residential Deliveries Per Capita												
Mean	89.4	94.9	74.4	73.6	83.8	82.7	82.5	85.4	91.7	87.1	92.6	57.8
Median	67.8	72.1	57.9	69.6	70.5	78.9	69.4	83.7	82.5	85.2	99.3	66.1
S.D.	58.0	70.7	44.0	35.6	48.4	33.0	49.4	41.2	32.0	33.8	36.4	24.8
(Obs.)	(15)	(34)	(28)	(28)	(35)	(35)	(33)	(35)	(34)	(34)	(13)	(8)
PRIVATE												
Residential Deliveries Per Capita												
Mean	124.2	79.8	72.5	81.0	86.9	80.1	69.6	89.2	65.8	74.0	72.5	72.3
Median	88.9	61.8	58.0	66.3	71.8	56.2	55.5	78.2	49.5	58.3	64.0	72.3
S.D.	93.4	50.1	47.4	46.0	61.1	62.2	47.1	47.8	33.9	50.5	21.2	0.0
(Obs.)	(21)	(38)	(32)	(37)	(41)	(41)	(32)	(17)	(8)	(22)	(5)	(1)
ANCILLARY												
Residential Deliveries Per Capita												
Mean	75.7	96.9	-	-	-	-	-	-	-	-	-	-
Median	75.0	57.5	-	-	-	-	-	-	-	-	-	-
S.D.	79.8	118.5	-	-	-	-	-	-	-	-	-	-
(Obs.)	(17)	(26)	-	-	-	-	-	-	-	-	-	-

ANNUAL DELIVERIES PER CONNECTION FOR ALL SYSTEMS

(000 gallons/year)

RESIDENTIAL, WHOLESALE, AND TOTAL DELIVERIES PER CONNECTION ALL INCREASE WITH INCREASING SYSTEM SIZE. THE ORDER OF THE DELIVERIES IN EACH SIZE CATEGORY IS GENERALLY AS WOULD BE EXPECTED: WHOLESALE IS THE LARGEST, FOLLOWED BY OTHER (LARGELY AGRICULTURAL AND MUNICIPAL USE), THEN COMMERCIAL/INDUSTRIAL, THEN RESIDENTIAL, AND FINALLY FIRE. ALSO, WHEN EXAMINED ACROSS OWNERSHIPS, PUBLIC SYSTEMS HAVE HIGHER DELIVERIES PER CONNECTION IN ALL BUT TWO SIZES.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Total Deliveries/Connection												
Residential												
Mean	74.3	99.1	78.1	82.6	116.0	109.9	115.4	131.0	135.8	135.2	159.4	127.2
S.D.	54.7	86.6	44.1	49.1	76.4	51.5	65.2	73.2	68.3	71.5	66.8	54.9
Commercial/Industrial												
Mean	544.2	218.2	239.4	547.1	807.2	1,902.7	733.7	920.4	1,182.4	2,215.6	1,127.3	1,396.6
S.D.	744.2	-	399.9	1,771.7	1,112.9	4,376.6	575.9	649.0	2,725.3	3,445.4	472.7	1,401.1
Wholesale												
Mean	-	3,961.9	12,707.3	5,299.9	34,621.4	100,970.5	108,805.1	142,418.0	266,814.7	190,479.5	581,631.1	2,026,965.2
S.D.	-	-	-	11,033.7	37,149.1	128,772.0	134,643.5	129,925.7	386,683.7	304,500.7	554,426.9	1,756,933.4
Other[1]												
Mean	479.6	1,002.5	3,177.2	1,087.1	1,550.1	16,061.5	16,211.0	105,779.5	5,543.1	9,026.5	1,041,481.8	-
S.D.	721.0	2,479.4	9,872.4	1,580.7	2,065.2	59,619.8	35,527.3	515,096.9	14,840.8	19,554.6	2,270,472.4	-
Fire[2]												
Mean	0.9	5.9	23.3	49.6	144.8	74.9	241.6	1,303.2	288.4	85.8	63.0	993.5
S.D.	-	-	49.1	155.7	504.9	367.0	965.6	5,540.5	550.0	387.9	83.5	1,188.9
Total												
Mean	127.2	162.4	87.3	117.0	180.9	182.5	184.1	222.7	223.0	223.0	285.8	346.2
S.D.	180.7	310.9	49.6	80.3	158.1	111.3	87.8	181.2	83.7	80.5	94.7	196.4
Total Deliveries/Connection												
Public												
Mean	158.7	203.6	87.6	115.0	184.0	186.8	191.0	228.6	228.4	230.2	319.3	360.9
(Obs.)	(18)	(35)	(35)	(40)	(46)	(40)	(42)	(46)	(46)	(48)	(14)	(9)
Private												
Mean	82.8	86.8	85.9	129.2	153.5	157.9	154.5	197.4	199.1	186.0	204.1	127.9
(Obs.)	(22)	(40)	(32)	(40)	(47)	(45)	(37)	(19)	(9)	(23)	(7)	(1)
Ancillary												
Mean	152.7	175.0	-	-	-	-	-	-	-	-	-	-
(Obs.)	(13)	(24)	-	-	-	-	-	-	-	-	-	-

Note: Wholesalers and other special situations such as schools and prisons are excluded.
[1]Other connections include agricultural and institutional connections; therefore, figures range widely.
[2]Fire deliveries are frequently unknown; therefore, figures vary widely.

SYSTEMS NOT PROVIDING ADDITIONAL TREATMENT BY WATER SOURCE

FOR GROUND WATER AND OTHER WATER SOURCE TYPES, THE PERCENTAGE OF SYSTEMS NOT TREATING THEIR WATER DECREASES WITH INCREASING SYSTEM SIZE. ALMOST ALL SURFACE WATER SYSTEMS TREAT THEIR WATER. "OTHER" WATER SOURCE SYSTEMS, WHICH GENERALLY PURCHASE ALREADY TREATED WATER, ARE LEAST LIKELY TO TREAT.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Percentage Not Providing Additional Treatment												
Predominantly Surface Water	0.0%	0.0%	16.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(Obs.)	(4)	(6)	(6)	(13)	(25)	(26)	(32)	(33)	(22)	(41)	(19)	(12)
Predominantly Ground Water	56.5	49.6	32.9	30.4	28.3	17.5	7.0	22.2	25.0	11.5	0.0	0.0
(Obs.)	(92)	(119)	(85)	(69)	(60)	(57)	(43)	(18)	(16)	(26)	(5)	(1)
Other	100.0	80.0	100.0	90.0	45.5	71.4	63.6	50.0	52.6	37.5	33.3	100.0
(Obs.)	(6)	(11)	(3)	(10)	(11)	(14)	(11)	(18)	(19)	(8)	(3)	(1)
All Systems	56.3%	49.6%	33.3%	33.9%	22.6%	19.6%	15.1%	18.3%	24.6%	8.6%	7.3%	7.2%

III.2 TREATMENT PROFILE

TREATMENT PROFILE FOR ALL SYSTEMS

(of those who treat, percent using type of treatment)

AS MIGHT BE EXPECTED, DISINFECTION IS THE MOST COMMON TREATMENT ACROSS ALL SIZES, WITH FLUORIDE ADDITION AND POWDERED ACTIVATED CARBON ALSO QUITE COMMON IN THE LARGER SIZES. WITHIN DISINFECTION, THE PREFERENCE FOR A PARTICULAR METHOD SHOWS A STRONG RELATIONSHIP TO SIZE.

	POPULATION CATEGORY											
	25-100[3]	101-500[3]	501-[3] 1,000	1,001-[3] 3,300	3,301- 10,000	10,001- 25,000	25,001- 50,000	50,001- 75,000	75,001- 100,000	100,001- 500,000	500,001-[3] 1,000,000	OVER 1,000,000
Treatment												
Disinfection												
Ammonia & Chlorine (chloramines)	1.0%	0.7%	3.1%	0.0%	6.3%	11.6%	9.7%	13.2%	15.6%	25.3%	44.3%	21.5%
Liquid Gas Chlorine[1]	31.7	33.8	50.8	58.3	68.0	71.0	74.5	76.0	60.7	78.7	70.7	85.7
Hypochlorite[1]	8.5	8.8	11.6	4.2	8.3	7.5	8.1	1.5	3.5	5.4	11.2	7.1
Other Disinfection	0.8	1.5	0.0	2.2	0.0	1.0	2.1	7.4	1.7	4.0	7.4	0.0
Total	41.2%	44.8%	65.5%	64.8%	80.4%	86.0%	83.7%	85.8%	77.9%	100.0%	96.5%	92.8%
Conventional Plant (coagulation, sedimentation, filtration)	4.3	6.7	2.4	11.8	24.1	37.1	41.1	52.5	49.1	57.5	73.7	78.5
Direct Filtration	5.8	5.9	5.5	6.3	13.5	13.4	17.3	18.9	10.3	22.0	22.5	14.3
Fluoride Addition	0.0	2.3	5.3	14.6	24.0	28.1	42.7	46.0	43.6	47.7	63.0	71.4
Corrosion Control	0.0	6.5	5.5	6.0	20.0	30.2	39.4	42.1	34.7	45.1	74.0	71.4
Granular Activated Carbon	3.1	0.8	1.1	3.3	5.2	6.6	5.4	4.4	10.5	9.2	11.1	0.0
Powdered Activated Carbon	0.0	0.0	0.0	3.5	9.5	12.2	16.2	30.4	31.8	36.2	66.3	57.1
Aeration[2]	2.1	8.0	4.2	6.5	13.7	13.8	15.2	22.9	15.3	12.8	22.5	0.0
Lime Soda Softening	2.5	4.5	3.1	8.0	8.5	14.3	9.8	11.5	12.0	9.1	25.8	7.1
Iron Removal[2]	0.8	7.2	5.5	7.3	9.4	14.3	21.7	18.7	13.7	19.0	26.1	7.1
Reverse Osmosis	0.0	0.0	1.1	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activated Alumina	0.0	0.0	0.0	1.3	3.1	3.7	1.1	0.0	0.0	2.7	3.7	0.0
Cation Exchange[2]	0.0	0.0	2.2	2.0	1.1	1.0	2.1	4.4	1.7	1.2	0.0	0.0
Anion Exchange	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.5	0.0	1.3	0.0	0.0
Other	3.8%	7.2%	7.4%	9.5%	16.8%	12.5%	16.3%	10.0%	15.7%	15.6%	25.8%	0.0%

Note: Multiple answers are allowed.

[1]Overlapping responses may occur here since sodium hypochlorite responses may be mistakenly included under Liquid/Gas Chlorine instead of Hypochlorite.

[2]Overlapping responses may occur here since Aeration and Cation Exchange are methods of Iron Removal.

[3]Small number of observations used to generalize to total population.

TREATMENT PROFILE BY WATER SOURCE

(of those who treat, percent using type of treatment)

OF THOSE SYSTEMS THAT DO TREAT THEIR WATER, THE MOST FREQUENT TYPES OF TREATMENT USED ARE LISTED IN THIS TABLE. AS EXPECTED, SURFACE WATER SYSTEMS ARE MORE COMMON USERS THAN GROUND WATER SYSTEMS OF ALL THESE TREATMENTS EXCEPT AERATION. SINCE "OTHER" WATER SOURCE SYSTEMS PRIMARILY COVER SYSTEMS THAT PURCHASE ALREADY TREATED WATER, THESE SYSTEMS ARE LESS LIKELY TO IMPLEMENT TREATMENT WITH THE EXCEPTION OF DISINFECTION.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
PREDOMINANTLY SURFACE WATER												
Treatment												
Disinfection	100.0%	83.4%	83.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Conventional	75.0	33.3	16.7	53.8	60.0	88.5	87.5	84.8	95.5	82.9	94.7	83.3
Corrosion Control	0.0	0.0	16.7	30.8	44.0	61.5	71.9	69.7	50.0	63.4	78.9	75.0
Fluoride Addition	0.0	16.7	0.0	15.4	48.0	46.2	65.6	69.7	77.3	65.9	73.7	75.0
Aeration	0.0%	0.0%	0.0%	15.4%	16.0%	7.7%	21.9%	21.2%	4.5%	9.8%	15.8%	0.0%
(Obs.)	(4)	(6)	(6)	(13)	(25)	(26)	(32)	(33)	(22)	(41)	(19)	(12)
PREDOMINANTLY GROUND WATER												
Treatment												
Disinfection	40.9%	45.0%	65.8%	68.0%	75.0%	93.0%	88.4%	88.9%	87.5%	99.9%	100.0%	100.0%
Conventional	2.2	5.8	1.2	4.3	10.0	14.0	23.3	16.7	31.2	19.2	0.0	100.0
Corrosion Control	0.0	7.5	4.7	1.4	11.7	19.3	27.9	11.1	37.5	23.1	60.0	100.0
Fluoride Addition	0.0	1.7	5.9	17.4	15.0	22.8	39.5	27.8	43.7	26.9	40.0	100.0
Aeration	2.2%	8.3%	4.7%	5.8%	15.0%	21.1%	16.3%	33.3%	37.5%	23.1%	60.0%	0.0%
(Obs.)	(93)	(120)	(85)	(69)	(60)	(57)	(43)	(18)	(16)	(26)	(5)	(1)
OTHER												
Treatment												
Disinfection	0.0%	20.0%	0.0%	9.1%	63.7%	28.5%	41.6%	55.6%	45.0%	100.0%	66.7%	0.0
Conventional	0.0	0.0	0.0	0.0	18.2	7.1	0.0	22.2	10.0	44.4	66.7	0.0
Corrosion Control	0.0	0.0	0.0	0.0	9.1	0.0	8.3	16.7	15.0	22.2	66.7	0.0
Fluoride Addition	0.0	0.0	0.0	0.0	18.2	7.1	8.3	16.7	5.0	22.2	33.3	0.0
Aeration	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.7%	10.0%	0.0%	0.0%	0.0%
(Obs.)	(6)	(10)	(3)	(11)	(11)	(14)	(12)	(18)	(20)	(9)	(3)	(1)

Note: Multiple answers are allowed.

TREATMENT LOCATIONS BY WATER SOURCE

AS MAY BE EXPECTED, SURFACE WATER SYSTEMS TREAT AT CENTRAL LOCATIONS MUCH MORE OFTEN THAN DO GROUND WATER SYSTEMS. MOREOVER, THEY ALSO REPORT USING A LARGER NUMBER OF CENTRAL TREATMENT LOCATIONS THEN DO GROUND WATER SYSTEMS THAT USE CENTRAL TREATMENT SET-UPS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
PREDOMINANTLY SURFACE WATER												
Percent Treating at												
Each well or water source	25.0%	50.0%	60.0%	30.8%	16.0%	12.0%	12.5%	9.1%	9.1%	9.8%	5.3%	8.3%
Central locations	75.0	50.0	40.0	69.2	80.0	84.0	78.1	78.8	86.4	82.9	68.4	91.7
Mean number of locations	1.00	1.33	1.00	1.00	1.11	1.29	1.44	1.38	1.42	2.79	2.39	3.45
Other[1]	0.0%	0.0%	0.0%	0.0%	4.0%	4.0%	9.4%	12.1%	4.5%	7.3%	26.3%	0.0%
(Obs.)	(4)	(6)	(5)	(13)	(25)	(25)	(32)	(33)	(22)	(41)	(19)	(12)
PREDOMINANTLY GROUND WATER												
Percent Treating at												
Each well or water source	60.0%	68.3%	63.2%	56.3%	65.9%	55.3%	27.5%	50.0%	15.4%	34.8%	60.0%	0.0%
Central locations	37.5	28.3	35.1	39.6	29.5	38.3	47.5	50.0	76.9	39.1	40.0	0.0
Mean number of locations	1.00	1.09	1.35	1.68	1.40	2.06	3.21	3.29	1.70	5.22	6.00	-
Other[1]	2.5%	3.3%	1.7%	4.1%	4.6%	6.4%	25.0%	0.0%	7.7%	26.1%	0.0%	100.0%
(Obs.)	(40)	(60)	(57)	(48)	(44)	(47)	(40)	(14)	(13)	(23)	(5)	(1)
OTHER												
Percent Treating at												
Each well or water source	-	0.0%	0.0%	0.0%	33.3%	25.0%	50.0%	11.1%	44.4%	20.0%	0.0%	-
Central locations	-	100.0	100.0	100.0	66.7	75.0	50.0	55.6	44.4	60.0	100.0	-
Mean number of locations	-	1.00	1.00	1.00	1.25	1.33	2.00	1.17	3.25	4.00	2.50	-
Other[1]	-	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%	11.1%	20.0%	0.0%	-
(Obs.)	(0)	(2)	(1)	(1)	(6)	(4)	(4)	(9)	(9)	(5)	(2)	(0)

[1]"Other" includes treating at both central locations and at each well, and treating at only some wells on some surface water sources.

TREATMENT CAPACITY PROFILE BY WATER SOURCE

NEITHER TOTAL TREATMENT CAPACITY OR AVERAGE PRODUCTION/AVERAGE CAPACITY SEEM TO DIFFER WHEN COMPARED ACROSS WATER SOURCE TYPES. AVERAGE DAILY PRODUCTION GENERALLY USES BETWEEN 40-60 PERCENT OF A SYSTEM'S TREATMENT CAPACITY, NO MATTER HOW LARGE THE SYSTEM.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS												
Total Treatment Capacity (MGD)[2]												
Mean	0.05[1]	0.15	0.38[1]	1.47	6.80	6.77	16.09	22.80	28.00	97.31	231.71	1,135.9[1]
S.D.	0.16	0.22	0.71	2.16	30.38	9.22	14.69	20.30	20.16	199.77	120.51	845.8
Average Production/ Treatment Capacity[3]	0.48	0.46	0.46	0.39	0.46	0.57	0.46	0.66	0.95	0.82	0.99	0.49
PREDOMINANTLY SURFACE WATER												
Total Treatment Capacity (MGD)[2]												
Mean	0.19	0.39	0.32	0.64	2.45	6.48	12.30	27.93	33.78	87.84	265.0	1,135.9
Median	0.25	0.58	0.39	0.40	2.00	6.00	12.00	20.00	30.00	60.00	289.0	692.0
S.D.	0.17	0.32	0.20	0.61	1.50	3.06	4.54	27.15	20.16	114.29	127.9	845.8
(Obs.)	(4)	(4)	(5)	(12)	(23)	(25)	(31)	(32)	(22)	(41)	(17)	(11)
Average Production/ Treatment Capacity[3]	0.21	0.34	0.55	0.57	0.55	0.50	0.50	0.55	0.64	0.60	0.52	0.49
PREDOMINANTLY GROUND WATER												
Total Treatment Capacity (MGD)[2]												
Mean	0.05	0.14	0.39	1.77	9.46	7.96	17.32	18.70	33.83	122.58	84.19	-
Median	0.01	0.08	0.22	0.72	2.00	4.69	12.10	21.79	30.00	48.90	35.37	-
S.D.	0.14	0.15	0.73	2.46	38.17	12.27	17.47	7.25	27.64	318.46	124.63	-
(Obs.)	(25)	(50)	(47)	(38)	(34)	(43)	(34)	(12)	(13)	(18)	(4)	(0)
Average Production/ Treatment Capacity[3]	0.49	0.46	0.45	0.39	0.39	0.62	0.46	0.68	0.53	1.30	3.00	-
OTHER												
Total Treatment Capacity (MGD)[2]												
Mean	-	0.10	-	1.0	1.79	3.00	20.00	16.61	16.75	75.20	275.00	-
Median	-	0.16	-	1.0	1.64	4.00	33.00	16.00	15.00	80.00	275.00	-
S.D.	-	0.08	-	0.0	1.32	1.41	18.38	9.43	10.01	44.33	0.0	-
(Obs.)	(0)	(2)	(0)	(1)	(4)	(2)	(2)	(7)	(7)	(4)	(2)	(0)
Average Production/ Treatment Capacity[3]	-	0.57	-	0.18	0.70	0.53	0.37	0.87	1.64	0.60	0.53	-

Note: Only systems that treat their water are included in these figures.
[1]When no observations occur in one or more source categories, all system total based only on observation in remaining categories.
[2]Total Treatment Capacity is defined as the amount that could be pumped and treated at all treatment locations for each system in a day.
[3]Average Production/Capacity is the ratio of average daily production to total treatment capacity.

TREATMENT PLANT OPERATORS

AS MIGHT BE EXPECTED, THE AVERAGE NUMBER OF TREATMENT PLANT OPERATORS INCREASES WITH INCREASING SYSTEM SIZE AS DOES THE PERCENT OF OPERATORS WHO WORK FULLTIME AND THE HOURS PER WEEK WORKED. HOWEVER, THE PERCENT OF OPERATORS CERTIFIED PEAKS IN THE MIDDLE SIZES AT ABOUT 76 PERCENT. SURFACE WATER SYSTEMS GENERALLY HAVE MORE TREATMENT PLANT OPERATORS AND A HIGHER PERCENTAGE OF FULLTIME AND CERTIFIED OPERATORS THAN DO GROUND WATER SYSTEMS. THIS FINDING IS CONSISTENT WITH THE FACT THAT THE USE OF TREATMENT INCREASES WITH SYSTEM SIZE AND THAT THE USE OF TREATMENT IS HIGHER AMONG SURFACE WATER SYSTEMS THAN IT IS AMONG GROUND WATER SYSTEMS.

TREATMENT PLANT OPERATORS

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Number of Operators Mean	0.5	0.9	1.1	1.6	2.5	4.1	5.9	7.8	9.4	12.1	27.1	66.9
Percent Fulltime Mean	17.3%	29.7%	42.6%	55.1%	84.8%	86.7%	88.9%	97.7%	98.3%	97.1%	98.1%	100.0%
Percent Certified Mean	49.7%	62.9%	68.5%	74.0%	73.3%	76.0%	71.4%	74.8%	75.0%	64.8%	52.6%	49.0%
Hours/Week Worked[2] Mean	5.4	9.8	14.2	17.5	23.4	27.5	34.8	39.1	39.2	39.3	39.3	41.3
PREDOMINANTLY SURFACE WATER												
Number of Operators Mean Median (Obs.)	1.3 1.0 (4)	1.8 1.5 (6)	1.3 1.0 (6)	2.2 2.0 (13)	3.2 3.0 (25)	5.5 5.0 (26)	6.6 5.0 (32)	8.8 8.0 (33)	12.0 11.5 (22)	13.3 13.0 (41)	23.2 20.0 (19)	57.9 39.5 (12)
Percent Fulltime Mean Median	25.0% 0.0	30.0% 0.0	33.3% 16.7	50.7% 50.0	100.0% 100.0	91.1% 100.0	88.2% 100.0	98.3% 100.0	97.1% 100.0	97.4% 100.0	97.6% 100.0	100.0% 100.0
Percent Certified Mean Median	50.0% 50.0	62.0% 60.0	41.7% 33.3	61.9% 63.3	74.4% 79.2	75.9% 81.7	61.8% 72.4	82.1% 100.0	71.7% 81.7	60.6% 66.7	55.7% 68.1	45.8% 35.4
Hours/Week Worked[2] Mean Median (Obs.)	12.8 10.0 (4)	19.4 20.0 (5)	13.0 10.0 (4)	18.6 16.5 (12)	31.0 40.0 (22)	37.3 40.0 (24)	39.1 40.0 (32)	40.8 40.0 (32)	40.9 40.0 (22)	40.4 40.0 (41)	40.3 40.0 (18)	41.1 40.0 (12)
PREDOMINANTLY GROUND WATER												
Number of Operators Mean Median (Obs.)	0.5 0.0 (93)	0.9 1.0 (120)	1.1 1.0 (85)	1.4 1.0 (69)	2.2 1.0 (60)	3.2 2.0 (57)	5.3 4.0 (43)	5.6 4.0 (17)	5.7 5.0 (16)	10.1 5.0 (25)	41.6 15.0 (5)	173.0 173.0 (1)
Percent Fulltime Mean Median	17.1% 0.0	29.7% 0.0	43.4% 33.3	56.1% 80.0	78.4% 100.0	80.9% 100.0	89.5% 100.0	96.4% 100.0	100.0% 100.0	96.7% 100.0	100.0% 100.0	100.0% 100.0
Percent Certified Mean Median	49.7% 50.0	62.9% 100.0	70.8% 100.0	76.8% 100.0	72.8% 100.0	76.0% 91.7	70.4% 100.0	59.2% 80.0	79.7% 100.0	72.1% 86.6	41.2% 32.4	86.7% 86.7
Hours/Week Worked[2] Mean Median (Obs.)	5.2 2.0 (37)	9.2 5.0 (65)	14.3 10.0 (60)	17.2 12.0 (49)	20.2 20.0 (34)	21.6 20.0 (42)	31.6 40.0 (37)	35.5 40.0 (11)	36.8 40.0 (10)	37.4 40.0 (18)	35.7 37.0 (4)	44.0 44.0 (1)

[1]These figures do not include "Other Water Source" systems which generally have few or no operators.
[2]Hours/Week Worked refers to the average number of hours worked by each operator.

III.3 DISTRIBUTION SYSTEM PROFILE

DISTRIBUTION SYSTEM FOR ALL SYSTEMS

AS WOULD BE EXPECTED, SYSTEMS SERVING LARGE POPULATIONS GENERALLY HAVE MORE MILES OF DISTRIBUTION THAN DO SYSTEMS SERVING SMALLER POPULATIONS. THE LARGE SIZE SYSTEMS WITH LESS THAN 100 MILES OF DISTRIBUTION ARE WHOLESALERS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
Miles of Distribution[1]												
< 1 mile	59.2%	25.9%	4.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1-5 miles	30.1	46.3	30.3	10.5	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-24 miles	9.4	21.6	53.3	59.7	16.9	7.7	0.5	0.0	1.6	0.0	3.5	0.0
25-99 miles	0.0	5.0	10.8	18.0	69.9	53.2	10.5	3.2	1.6	5.0	0.0	6.7
100-499 miles	0.0	0.6	0.8	6.3	9.2	36.8	86.0	87.7	86.6	27.8	3.5	0.0
500-999 miles	0.0	0.0	0.0	0.0	1.8	0.3	0.9	4.9	6.5	40.0	7.7	6.7
1,000-2,500 miles	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	25.5	63.4	13.4
Over 2,500 miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	3.7	1.7	21.9	66.5
Unsure	1.3	0.6	0.8	5.2	0.4	2.0	1.6	1.6	0.0	0.0	0.0	6.7
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: All system totals are based on weighted results for each ownership category.

[1]Distribution System is defined as transmission and distribution mains (not connections or service laterals).

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DISTRIBUTION PIPING AND LINING FOR ALL SYSTEMS

THE TYPE OF DISTRIBUTION PIPE USED BY WATER SYSTEMS CORRELATES DISTINCTLY WITH SIZE OF SYSTEM. SMALL SYSTEMS ARE MORE LIKELY TO HAVE PLASTIC PIPING AND LARGE SYSTEMS TEND TO HAVE A HIGH PERCENTAGE OF CAST OR DUCTILE IRON PIPING. ASBESTOS CEMENT IS FOUND IN MODERATE PERCENTAGES AMONG MEDIUM SIZE SYSTEMS WHILE CONCRETE PIPING IS INFREQUENTLY USED BY ALL BUT THE LARGEST SYSTEMS. ALL THE PIPING IS GENERALLY UNLINED EXCEPT FOR THE CAST OR DUCTILE IRON WHICH TENDS TO BE LINED WITH CEMENT.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Percentage of Total Pipe												
Concrete	0.0%	0.1%	0.9%	0.3%	0.04%	0.5%	0.5%	1.4%	3.1%	3.4%	7.5%	9.9%
No lining	-	0.0%	16.7%	9.3%	20.0%	26.4%	53.6%	50.0%	56.2%	48.4%	61.9%	65.2%
Cement lining	-	0.04	0.0	0.0	0.0	0.0	18.8	27.6	23.3	25.5	28.6	20.4
Other lining	-	0.0	0.0	0.0	0.0	34.0	14.5	4.8	3.3	1.1	9.5	0.0
Don't know/no answer	-	0.04%	83.3%	4.7%	80.0%	39.6%	13.1%	9.6%	17.2%	25.0%	0.0%	14.4%
Asbestos Cement	4.7%	7.4%	12.5%	17.0%	16.7%	19.2%	12.2%	26.0%	24.0%	17.4%	8.9%	5.5%
No lining	*46.0%	55.1%	55.5%	52.2%	76.2%	71.3%	63.1%	70.5%	75.7%	52.6%	80.6%	73.2%
Cement lining	0.0	0.5	0.0	6.9	3.4	9.8	16.0	2.4	3.0	9.7	19.4	0.0
Other lining	0.0	0.0	0.0	0.0	4.0	1.5	5.5	8.6	12.2	11.9	0.0	0.0
Don't know/no answer	54.0%	44.4%	44.5%	40.9%	16.4%	17.4%	15.4%	18.5%	9.1%	25.8%	0.0%	26.8%
Cast or Ductile Iron	13.2%	22.6%	48.9%	55.4%	65.4%	68.0%	77.4%	61.0%	65.0%	71.5%	74.2%	70.8%
No lining	58.7%	48.5%	42.0%	35.0%	40.4%	34.1%	16.6%	21.8%	21.1%	14.8%	11.8%	14.4%
Cement lining	5.7	7.0	11.5	21.3	46.9	57.5	69.1	69.4	72.1	73.9	75.9	64.1
Other lining	5.3	12.7	2.3	0.4	1.9	1.7	3.8	1.2	1.7	3.3	8.1	7.1
Don't know/no answer	30.3%	31.8%	44.2%	35.3%	10.8%	6.6%	10.5%	7.6%	5.1%	8.0%	4.2%	14.4%
Plastic	67.1%	56.3%	32.0%	22.6%	12.0%	9.0%	3.5%	4.4%	1.9%	1.6%	0.4%	2.0%
Other	15.0%	13.6%	5.7%	4.6%	5.9%	3.4%	6.4%	7.2%	6.0%	6.1%	9.0%	11.8%

*Note: All system totals are based on weighted results for each ownership category.

PHYSICAL AND MANAGEMENT REGIONALIZATION FOR ALL SYSTEMS

PHYSICAL AND MANAGEMENT REGIONALIZATIONS, IN GENERAL, ARE MORE COMMON WITH INCREASING SYSTEM SIZE, WITH REGIONALIZATION FOR EMERGENCY PURPOSES BEING THE MOST COMMON FORM OF REGIONALIZATION. WHEN EXAMINED ON THE BASIS OF OWNERSHIP THE ONLY STRONG DIFFERENTIAL RELATIONSHIP IS THE MUCH HIGHER FREQUENCY OF MANAGEMENT REGIONALIZATION AMONG PRIVATE SYSTEMS. THIS MAY BE RELATED TO THE PARENT COMPANY STRUCTURE COMMON AMONG PRIVATE SYSTEMS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
Percent Physically[1] Regionalized--For Other Than Emergencies												
Public	14.3%	6.0%	4.0%	8.0%	12.0%	8.0%	20.0%	28.0%	36.0%	28.0%	45.0%	50.0%
Private	5.9	2.0	6.0	10.0	14.0	18.0	10.0	15.0	0	26.9	28.6	0
Ancillary	0.0	4.0	-	-	-	-	-	-	-	-	-	-
All Systems	3.3%	4.3%	4.4%	8.6%	12.2%	9.5%	18.5%	26.1%	29.4%	27.8%	40.2%	46.9%
Percent Physically[1] Regionalized--For Emergencies Only												
Public	2.9%	4.0%	2.0%	10.0%	12.0%	26.0%	40.0%	34.0%	32.0%	38.0%	30.0%	21.4%
Private	2.9	4.0	8.0	20.0	24.0	32.0	30.0	25.0	33.3	38.5	42.9	100.0
Ancillary	6.0	4.0	-	-	-	-	-	-	-	-	-	-
All Systems	4.6%	4.0%	3.1%	11.4%	13.2%	26.9%	38.5%	32.7%	32.2%	38.1%	33.8%	26.4%
Percent Management[2] Regionalized												
Public	11.4%	6.0%	8.0%	6.0%	4.0%	2.0%	16.0%	14.0%	16.0%	18.0%	25.0%	28.6%
Private	5.9	14.0	14.0	10.0	22.0	36.0	40.0	35.0	22.2	38.5	42.9	0
Ancillary	0.0	0.0	-	-	-	-	-	-	-	-	-	-
All Systems	3.1%	6.3%	9.1%	6.6%	5.9%	7.1%	19.6%	17.2%	17.1%	21.8%	30.2%	26.8%

Note: All system totals are based on weighted results for each ownership category.

[1]Physical regionalization means that a system is physically hooked up to another system.
[2]Management regionalization means that a system shares some management services, such as billing procedures.

IV. REVENUES AND EXPENSES

IV.1 REVENUE DATA

IV.2 RATES

IV.3 EXPENSE DATA

IV.4 FINANCIAL PERFORMANCE

IV.1 REVENUE DATA

WATER OPERATION REVENUES BY OWNERSHIP

($000)

PRIVATELY OWNED SYSTEMS GENERALLY HAVE HIGHER REVENUES FROM WATER OPERATIONS THAN DO PUBLIC SYSTEMS. THE GAP BETWEEN PUBLIC AND PRIVATE REVENUES IS PARTICULARLY LARGE AMONG THE MEDIUM-SIZED SYSTEMS. IN ADDITION, A SIGNIFICANT PERCENTAGE OF SMALL PUBLIC SYSTEMS (LARGELY INSTITUTIONS SUCH AS PRISONS AND HOSPITALS) DO NOT CHARGE DIRECTLY FOR WATER.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Water Operation Revenues[2]												
Mean	$5.0	$16.2	$26.5	$77.1	$264.1	$773.6	$1,661.9	$2,819.9	$4,096.9	$8,673.3	$30,436.2	$90,866.1
S.D.	5.9	14.6	21.3	60.6	126.1	359.2	825.1	1,541.1	1,501.7	5,869.6	12,357.8	69,347.2
Percent not charging directly for water	7.1%	7.3%	4.0%	3.7%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PUBLIC												
Water Operation Revenues[2]												
Mean	$2.9	$19.0	$32.3	$70.6	$259.5	$762.5	$1,591.3	$2,742.1	$3,973.6	$8,353.4	$27,477.0	$94,689.5
Median	2.3	14.5	27.2	59.9	246.2	623.0	1,459.6	2,481.6	3,665.9	6,688.1	24,291.5	68,710.3
S.D.	$4.1	$16.4	$21.6	$52.2	$124.8	$360.0	$764.5	$1,637.2	$1,454.0	$5,956.9	$14,049.4	$71,640.6
(Obs.)	(14)	(42)	(44)	(44)	(46)	(47)	(49)	(49)	(48)	(48)	(19)	(13)
Percent not charging directly for water	40.0%	10.6%	4.3%	4.3%	0.0%	4.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PRIVATE												
Water Operation Revenues[2]												
Mean	$5.5	$12.0	$32.7	$117.2	$304.1	$836.6	$1,966.9	$3,156.0	$4,643.5	$10,316.0	$37,646.1	$34,000.1
Median	3.8	8.1	26.2	96.3	269.2	775.7	1,784.2	3,236.0	4,849.6	9,664.4	38,890.4	34,000.1
S.D.	$6.2	$11.0	$19.2	$96.9	$136.5	$354.7	$1,047.2*	$1,026.9	$1,696.7	$5,399.1	$6,623.2	$0.0
(Obs.)	(30)	(43)	(33))	(39)	(38)	(47)	(34)	(19)	(9)	(25)	(6)	(1)
Percent not charging directly for water	0.0%	2.3%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

[1]In the two smallest size categories, these figures do not include ancillary systems, which account for 54.8 percent and 31.4 percent, respectively, of these sizes.

[2]Water Operation Revenues is defined as revenues derived from the sale of water or new hook-ups; only systems that charge for water are included in this figure.

OTHER SOURCES OF REVENUE BY OWNERSHIP

OTHER SOURCES OF REVENUE (TYPICALLY RECREATION FEES AND INTEREST INCOME) ARE MORE COMMON AMONG PUBLIC SYSTEMS IN GENERAL AND LARGER SYSTEMS ACROSS BOTH OWNERSHIP TYPES. THE AMOUNT OF REVENUE IS SIGNIFICANTLY HIGHER FOR PUBLIC SYSTEMS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
PUBLIC												
Percent Having Other Sources of Revenue[1]	0.0%	12.0%	19.1%	26.5%	16.3%	24.5%	35.4%	40.0%	36.0%	58.0%	55.0%	69.2%
Mean Amount ($000)	$0.0	$6.4	$18.7	$15.8	$30.8	$152.2	$798.2	$590.2	$329.8	$1,134.2	$3,641.8	$16,295.8
Percent Receiving Funds from Municipal Fund	5.7%	6.0%	6.0%	10.0%	10.0%	10.0%	6.0%	2.0%	6.0%	10.0%	5.0%	7.7%
Mean Amount ($000)	$87.3	$3.5	$6.9	$13.9	$86.7	$102.7	$152.6	$799.7	$79.3	$1,635.0	$6,725.7	$50,000.0
PRIVATE												
Percent Having Other Sources of Revenue[1]	9.6%	6.3%	9.5%	17.8%	31.0%	35.4%	25.7%	36.8%	33.3%	28.0%	28.6%	100.0%
Mean Amount ($000)	$8.9	$11.3	$5.9	$7.2	$15.6	$37.5	$33.4	$125.3	$96.7	$332.0	$11.5	$18.0

[1]Other Sources of Revenue does not include diversified utility income such as sewer or electric power revenues.

WATER OPERATION REVENUES BY OWNERSHIP

($000)

PRIVATELY OWNED SYSTEMS GENERALLY HAVE HIGHER REVENUES FROM WATER OPERATIONS THAN DO PUBLIC SYSTEMS. THE GAP BETWEEN PUBLIC AND PRIVATE REVENUES IS PARTICULARLY LARGE AMONG THE MEDIUM-SIZED SYSTEMS. IN ADDITION, A SIGNIFICANT PERCENTAGE OF SMALL PUBLIC SYSTEMS (LARGELY INSTITUTIONS SUCH AS PRISONS AND HOSPITALS) DO NOT CHARGE DIRECTLY FOR WATER.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Water Operation Revenues[2]												
Mean	$5.0	$16.2	$26.5	$77.1	$264.1	$773.6	$1,661.9	$2,819.9	$4,096.9	$8,673.3	$30,436.2	$90,866.1
S.D.	5.9	14.6	21.3	60.6	126.1	359.2	825.1	1,541.1	1,501.7	5,869.6	12,357.8	69,347.2
Percent not charging directly for water	7.1%	7.3%	4.0%	3.7%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PUBLIC												
Water Operation Revenues[2]												
Mean	$2.9	$19.0	$32.3	$70.6	$259.5	$762.5	$1,591.3	$2,742.1	$3,973.6	$8,353.4	$27,477.0	$94,689.5
Median	2.3	14.5	27.2	59.9	246.2	623.0	1,459.6	2,481.6	3,665.9	6,688.1	24,238.5	68,710.3
S.D.	$4.1	$16.4	$21.6	$52.2	$124.8	$360.0	$764.5	$1,637.2	$1,454.0	$5,956.9	$14,049.4	$71,640.6
(Obs.)	(14)	(42)	(44)	(44)	(46)	(47)	(49)	(49)	(48)	(48)	(19)	(13)
Percent not charging directly for water	40.0%	10.6%	4.3%	4.3%	0.0%	4.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PRIVATE												
Water Operation Revenues[2]												
Mean	$5.5	$12.0	$32.7	$117.2	$304.1	$836.6	$1,966.9	$3,156.0	$4,643.5	$10,316.0	$37,646.1	$34,000.1
Median	3.0	8.1	26.2	96.3	269.2	775.7	1,784.2	3,236.0	4,849.6	9,664.4	38,890.4	34,000.1
S.D.	$6.2	$11.0	$19.2	$96.9	$136.5	$354.7	$1,047.2	$1,026.9	$1,696.7	$5,399.1	$6,623.2	$0.0
(Obs.)	(30)	(43)	(33))	(39)	(38)	(47)	(34)	(19)	(9)	(25)	(6)	(1)
Percent not charging directly for water	0.0%	2.3%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

[1] In the two smallest size categories, these figures do not include ancillary systems, which account for 54.8 percent and 31.4 percent, respectively, of these sizes.

[2] Water Operation Revenues is defined as revenues derived from the delivery of water to residential, commercial/industrial, wholesale, fire, and other (e.g., agricultural, municipal/institutional) connections, and from the initiation of new hook-ups. Only systems that charge for water are included in this figure.

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WATER OPERATION REVENUE PER THOUSAND GALLONS BY CUSTOMER CLASS FOR ALL SYSTEMS

(¢/1,000 gallons delivered)

FOR RESIDENTIAL, COMMERCIAL/INDUSTRIAL, AND THE AVERAGE FOR ALL CUSTOMER CLASSES, REVENUES PER 1,000 GALLONS DELIVERED CONSISTENTLY DECLINES WITH INCREASING SYSTEM SIZE. WHOLESALE AND OTHER REVENUES PER 1,000 GALLONS DELIVERED ARE OFTEN BASED ON SMALL SAMPLE SIZES AND DO NOT APPEAR TO FOLLOW ANY CLEAR PATTERN.

	POPULATION CATEGORY											
Revenue Rate[1]	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Residential												
Mean	200.4¢	172.1¢	168.0¢	157.7¢	128.0¢	104.6¢	116.8¢	107.3¢	91.8¢	102.4¢	83.4¢	63.8¢
S.D.	126.5	127.6	153.8	75.1	76.6	53.3	70.5	48.5	32.7	60.6	31.5	26.4
Commercial/Industrial												
Mean	179.1¢[3]	160.9¢[3]	179.8¢	105.6¢	128.9¢	78.8¢	85.6¢	80.8¢	94.3¢	68.8¢	70.0¢	51.1¢
S.D.	112.7	150.2	207.1	61.2	99.3	44.3	47.8	62.4	102.5	54.2	25.8	27.5
Wholesale												
Mean	-	70.5¢[3]	-	203.1¢[3]	94.4¢[3]	77.9¢	71.3¢	56.8¢	57.5¢	69.3¢	71.9¢	70.6¢
S.D.	-	-	-	190.2	90.6	107.5	30.7	29.4	33.4	86.7	70.2	94.1
Other[2]												
Mean	-	472.9¢[3]	1,436.5¢[3]	118.6¢[3]	343.4¢	473.0¢	325.2¢	2,877.2¢	89.7¢	5,044.3¢	253.2¢	-
S.D.	-	727.2	3,138.4	151.9	479.2	1,588.0	271.0	7,926.7	103.9	23,253.2	196.2	-
Average for All Sales												
Mean	190.4¢	171.5¢	150.0¢	122.4¢	106.2¢	85.7¢	94.2¢	82.1¢	76.5¢	77.5¢	73.0¢	55.9¢
S.D.	127.6	164.1	139.7	69.0	61.2	45.2	43.4	32.1	25.6	37.0	23.8	28.7

[1]Revenue is defined as Water Operation Revenue; it does not include Other Sources of Revenue or Transfers from the Municipal Fund. Revenue figures include only those who charge for water.

[2]"Other" includes both fire and other deliveries (e.g., agricultural connections, municipal/institutional connections).

[3]Small number of observations used to generalize to total population.

REVENUE PER THOUSAND GALLONS BY CUSTOMER CLASS BY OWNERSHIP

(¢/1,000 gallons delivered)

PRIVATELY OWNED SYSTEMS RECEIVE HIGHER REVENUE PER 1,000 GALLONS DELIVERED FOR RESIDENTIAL, COMMERCIAL/INDUSTRIAL, AND ALL SALES ON AVERAGE THAN PUBLIC SYSTEMS. THE DATA FOR WHOLESALE AND OTHER CONNECTIONS ARE OFTEN BASED ON SMALL SAMPLE SIZES AND RANGE SO WIDELY THAT NO CONCLUSIONS CAN BE MADE IN THIS AREA.

	POPULATION CATEGORY											
Revenue Rate	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
						PUBLIC						
Residential												
Mean	189.5¢	174.0¢	165.0¢	151.2¢	123.3¢	93.9¢	107.6¢	101.6¢	83.8¢	90.6¢	66.3¢	62.4¢
S.D.	91.1	134.3	148.4	70.8	61.9	47.6	71.8	45.7	28.4	40.4	21.7	27.2
(Obs.)	(6)	(28)	(16)	(17)	(27)	(25)	(27)	(26)	(24)	(26)	(12)	(6)
Commercial/Industrial												
Mean	320.2¢	109.0¢	195.6¢	100.8¢	129.2¢	75.6¢	81.5¢	80.4¢	93.4¢	61.3¢	55.0¢	50.8¢
S.D.	-	88.5	229.0	53.9	95.1	41.9	45.5	67.7	111.9	30.2	25.4	28.4
(Obs.)	(1)	(14)	(10)	(12)	(23)	(23)	(19)	(22)	(23)	(26)	(12)	(6)
Wholesale												
Mean	-	46.2¢	-	218.2¢	85.1¢	77.3¢	77.0¢	51.9¢	58.4¢	67.5¢	70.1¢	72.7¢
S.D.	-	-	-	202.5	62.2	114.9	30.8	29.9	34.2	87.3	80.6	97.2
(Obs.)	-	(1)	-	(2)	(6)	(10)	(9)	(12)	(15)	(19)	(11)	(6)
Other												
Mean	-	644.3¢	1,714.8¢	89.5¢	369.2¢	380.2¢	364.3¢	3,432.0¢	86.1¢	2,392.9¢	185.0¢	59.2¢
S.D.	-	925.0	3,683.3	57.6	504.6	1,074.3	290.2	8,791.2	110.2	5,021.2	176.0	47.0
(Obs.)	-	(5)	(6)	(6)	(3)	(11)	(5)	(7)	(13)	(11)	(4)	(5)
Average for All Sales												
Mean	116.0¢	168.4¢	150.2¢	112.8¢	103.7¢	76.6¢	87.6¢	77.5¢	72.1¢	70.8¢	54.0¢	54.5¢
Median	111.4	132.5	101.5	95.2	92.6	71.8	74.0	73.3	66.4	64.0	50.3	52.7
S.D.	109.1¢	189.6¢	144.3¢	66.4¢	58.9¢	40.4¢	41.1¢	30.7¢	24.8¢	35.4¢	19.0¢	29.6¢
(Obs.)	(14)	(35)	(31)	(31)	(40)	(37)	(39)	(44)	(40)	(47)	(15)	(11)
						PRIVATE						
Residential												
Mean	202.7¢	169.3¢	181.0¢	197.5¢	169.1¢	165.2¢	156.4¢	132.0¢	127.5¢	162.8¢	124.9¢	84.6¢
S.D.	132.9	116.9	175.1	96.8	153.3	77.1	64.1	58.6	46.6	118.5	46.6	0.0
(Obs.)	(20)	(29)	(21)	(21)	(23)	(31)	(28)	(15)	(8)	(21)	(5)	(1)
Commercial/Industrial												
Mean	148.7¢	238.0¢	112.7¢	135.0¢	126.0¢	97.1¢	103.4¢	82.5¢	98.4¢	107.2¢	106.6¢	55.7¢
S.D.	124.0	210.5	46.3	94.1	130.3	55.5	56.3	30.3	38.8	115.3	25.3	0.0
(Obs.)	(3)	(5)	(6)	(10)	(17)	(29)	(24)	(14)	(7)	(20)	(5)	(1)
Wholesale												
Mean	-	106.7¢	-	110.0¢	175.6¢	81.6¢	46.8¢	77.7¢	53.4¢	78.5¢	76.2¢	39.5¢
S.D.	-	-	-	80.2	213.9	47.5	29.2	26.3	29.6	83.5	33.2	0.0
(Obs.)	-	(1)	-	(3)	(5)	(9)	(8)	(4)	(5)	(14)	(3)	(1)
Other												
Mean	1,020.6¢	218.0¢	250.3¢	297.7¢	118.7¢	998.7¢	156.3¢	477.6¢	105.8¢	18,659.2¢	419.3¢	-
S.D.	-	205.4	330.8	379.7	108.4	3,204.8	163.2	637.5	69.1	56,460.2	237.6	-
(Obs.)	(1)	(2)	(5)	(2)	(12)	(14)	(11)	(11)	(2)	(17)	(2)	-
Average for All Sales												
Mean	206.4¢	176.1¢	149.1¢	181.1¢	127.8¢	137.4¢	122.9¢	102.0¢	96.0¢	111.6¢	119.4¢	76.5¢
Median	194.0	154.8	136.0	166.0	114.5	120.9	114.6	101.7	97.0	106.4	110.4	76.5
S.D.	131.1¢	116.3¢	118.1¢	82.2¢	78.5¢	65.4¢	51.0¢	36.0¢	28.3¢	43.6¢	31.2¢	0.0¢
(Obs.)	(21)	(32)	(24)	(29)	(29)	(36)	(31)	(18)	(9)	(23)	(5)	(1)

IV.2 RATES

RATE APPROVAL REQUIREMENTS BY OWNERSHIP

MANY MORE PRIVATELY OWNED SYSTEMS THAN PUBLIC SYSTEMS REPORT THAT THEY ARE REQUIRED TO OBTAIN APPROVAL FROM A STATE REGULATORY AUTHORITY TO CHANGE RATES. ALSO, IT APPEARS THAT WITHIN AN OWNERSHIP CATEGORY VERY SMALL AND VERY LARGE SYSTEMS NEED APPROVAL LESS OFTEN THAN DO MID-SIZED SYSTEMS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Systems Requiring Approval from State to Change Rates												
Approval required	33.5%	31.7%	26.5%	21.0%	20.5%	25.7%	29.2%	27.1%	26.1%	39.6%	39.1%	15.6%
Unsure/No answer	19.0	13.2	12.3	10.3	5.0	6.8	4.2	0	0	1.6	0	7.0
PUBLIC												
Systems Requiring Approval from State to Change Rates												
Approval required	11.4%	18.0%	20.0%	14.0%	16.0%	14.0%	18.0%	16.0%	12.0%	26.0%	20.0%	14.3%
Unsure/No answer	25.7	22.0	10.0	12.0	4.0	8.0	4.0	0	0	2.0	0	7.1
(Obs.)	(35)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(20)	(14)
PRIVATE												
Systems Requiring Approval from State to Change Rates												
Approval required	38.2%	52.0%	54.0%	64.0%	60.0%	92.0%	92.5%	90.0%	88.9%	100.0%	85.7%	100.0%
Unsure/No answer	17.6	0	22.0	2.0	14.0	0	5.0	0	0	0	0	0
(Obs.)	(34)	(50)	(50)	(50)	(50)	(50)	(40)	(20)	(9)	(26)	(7)	(1)

[1] In the two smallest size categories, these figures do not include ancillary systems which account for 54.8% and 31.4% respectively of these sizes.

RATE STRUCTURE FOR ALL SYSTEMS

IN THE SMALLEST SIZES, FLAT FEES ARE THE MOST COMMON METHODS USED TO CHARGE FOR WATER SERVICE. IN LARGER SIZES, THE COMBINATION (FLAT FEE PLUS A FLAT RATE) AND VARIOUS FORMS OF THE DECLINING BLOCK RATE STRUCTURE ARE THE MOST COMMON. THE MANY "OTHER" RESPONSES PRIMARILY INCLUDES SYSTEMS WITH MULTIPLE RATE STRUCTURES.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
Rate Structure												
Flat fee[1]	21.0%	21.0%	15.1%	11.9%	8.7%	1.7%	3.2%	5.9%	1.6%	1.7%	3.5%	7.8%
Flat rate[2]	1.9	5.9	5.1	4.5	10.9	7.6	11.4	16.6	15.0	6.9	10.6	15.6
Nonwater use measure[3]	0.0	1.6	2.5	0.0	0.0	3.5	1.6	0.0	0.0	1.7	0.0	0.0
Combination[4]	9.6	16.4	28.5	21.3	17.2	24.7	25.6	18.7	11.7	14.3	7.1	31.2
Declining block												
Pure declining block[5]	0.0%	10.6%	19.2%	17.8%	12.5%	20.3%	18.2%	23.7%	7.0%	16.2%	11.3%	7.8%
Declining block; minimum charge; water use[6]	4.9	7.4	11.1	23.1	32.3	20.4	24.4	13.0	28.2	14.6	15.4	21.9
Declining block; minimum charge; non-water use[7]	0.3%	1.5%	4.2%	3.0%	3.7%	3.5%	1.9%	5.2%	12.0%	13.3%	10.6%	0.0%
Total	5.2	19.5	34.5	43.9	48.5	44.2	44.5	41.9	47.2	44.1	37.3	29.7
Increasing block												
Pure increasing block[8]	0.0%	0.0%	3.8%	5.4%	1.8%	0.9%	1.6%	3.3%	5.0%	6.4%	0.0%	7.8%
Increasing block, minimum charge; water use[9]	0.0	1.1	0.0	3.6	0.0	2.0	0.0	0.0	0.0	0.0	4.2	0.0
Increasing block, minimum charge; non-water use[10]	0.0%	0.0%	0.0%	0.0%	0.2%	0.6%	2.1%	7.7%	5.0%	2.3%	0.0%	0.0%
Total	0.0	1.1	3.8	9.0	2.0	3.5	3.7	11.0	10.0	8.7	4.2	7.8
Other[11]	11.3	5.2	10.5	9.4	12.7	14.8	9.9	5.9	14.5	22.6	37.3	7.8
Not billed separately[12]	51.0	29.3	-	-	-	-	-	-	-	-	-	-
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

(continued)

[1]Flat fee = flat fee paid monthly or annually, not based on water use
[2]Flat rate = constant flat rate per unit of water use
[3]Nonwater use measure = charge based on such measures as lot size, size of service connection, etc.
[4]Combination = combination of any of the above rate structures, e.g., flat fee plus flat rate
[5]Pure declining block = charge per unit of water declines with increasing water use
[6]Declining block; minimum charge; water use = declining block rate with initial minimum charge covering specified amount of water use
[7]Declining block; minimum charge; nonwater use = declining block rate with initial minimum charge not covering any water use, based on such measures as meter size
[8]Pure increasing block = charge per unit of water increases with increasing water use
[9]Increasing block; minimum charge; water use = increasing block rate with initial minimum charge covering specified amount of water use
[10]Increasing block; minimum charge; nonwater use = increasing block rate with initial minimum charge not covering any water use
[11]Other = rate structures not otherwise included above. Also includes systems which have different types of rate structures for different customer classes
[12]Not billed separately = no separate charge for water services; this response option was offered to ancillary systems only.

RATE STRUCTURE BY OWNERSHIP

WHEN EXAMINED BY OWNERSHIP, A FEW INTERESTING RELATIONSHIPS EMERGE. ANCILLARY AND PUBLIC SYSTEMS ARE MORE LIKELY IN MOST SIZES TO USE FLAT FEE STRUCTURES WHILE PRIVATELY OWNED SYSTEMS ARE MORE LIKELY TO USE THE DECLINING BLOCK STRUCTURE THAT INCLUDES A MINIMUM CHARGE ASSOCIATED WITH WATER USE.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
PUBLIC												
Rate Structure												
Flat fee	28.1%	28.3%	12.5%	12.5%	8.2%	2.0%	4.0%	6.1%	2.1%	2.0%	5.0%	8.3%
Flat rate	9.4	13.0	6.3	4.2	12.2	8.2	14.0	20.4	18.4	8.2	15.0	16.7
Nonwater use measure	0.0	2.2	2.1	0.0	0.0	4.1	2.0	0.0	0.0	2.0	0.0	0.0
Combination (e.g., flat fee plus flat rate)	18.7	23.9	29.2	20.8	16.3	24.5	28.0	18.4	14.3	16.3	10.0	33.3
Pure declining block	0.0	17.4	22.9	18.8	12.2	20.4	20.0	24.5	6.1	16.3	10.0	8.3
Declining block; minimum charge; water use	3.2	8.7	10.4	22.9	32.7	18.4	20.0	10.2	24.5	12.2	10.0	16.7
Declining block; minimum charge; non-water use	3.2	2.2	4.2	2.1	4.1	4.1	0.0	4.1	12.2	12.2	15.0	0.0
Pure increasing block	0.0	0.0	4.2	6.3	2.0	0.0	2.0	4.1	6.1	6.1	0.0	8.3
Increasing block, minimum charge; water use	0.0	0.0	0.0	4.2	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Increasing block, minimum charge; non-water use	0.0	0.0	0.0	0.0	0.0	0.0	2.0	6.0	6.1	2.0	0.0	0.0
Other	37.5%	4.3%	8.3%	8.3%	12.2%	16.3%	8.0%	6.1%	10.2%	22.4%	35.0%	8.3%
(Obs.)	(32)	(46)	(48)	(46)	(48)	(48)	(50)	(48)	(50)	(48)	(20)	(12)
PRIVATE												
Rate Structure												
Flat fee	46.9%	34.0%	26.0%	8.2%	12.8%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%
Flat rate	3.1	2.0	0.0	6.1	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
Nonwater use measure	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combination (e.g., flat fee plus flat rate)	21.9	24.0	26.0	24.5	25.5	26.0	15.4	20.0	0.0	3.8	0.0	0.0
Pure declining block	0.0	10.0	4.0	12.2	14.9	20.0	10.3	20.0	11.1	15.4	14.3	0.0
Declining block; minimum charge; water use	12.5	14.0	14.0	24.5	27.7	32.0	43.6	25.0	44.4	26.9	28.6	100.0
Declining block; minimum charge; non-water use	0.0	2.0	4.0	8.2	0.0	0.0	10.3	10.0	11.1	19.2	0.0	0.0
Pure increasing block	0.0	0.0	2.0	0.0	0.0	6.0	0.0	0.0	0.0	7.7	0.0	0.0
Increasing block, minimum charge; water use	0.0	4.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	14.3	0.0
Increasing block, minimum charge; non-water use	0.0	0.0	0.0	0.0	2.1	4.0	2.6	15.0	0.0	3.8	0.0	0.0
Other	15.6%	10.0%	20.0%	16.3%	17.0%	6.0%	17.9%	5.0%	33.3%	23.1%	42.9%	0.0%
(Obs.)	(32)	(50)	(49)	(47)	(50)	(50)	(39)	(20)	(9)	(26)	(7)	(1)
ANCILLARY												
Rate Structure												
Flat fee	2.3%	0.0%	-	-	-	-	-	-	-	-	-	-
Flat rate	0.0	0.0	-	-	-	-	-	-	-	-	-	-
Nonwater use measure	0.0	0.0	-	-	-	-	-	-	-	-	-	-
Combination (e.g., flat fee plus flat rate)	0.0	2.2	-	-	-	-	-	-	-	-	-	-
Pure declining block	0.0	0.0	-	-	-	-	-	-	-	-	-	-
Declining block; minimum charge; water use	0.0	2.2	-	-	-	-	-	-	-	-	-	-
Declining block; minimum charge; non-water use	0.0	0.0	-	-	-	-	-	-	-	-	-	-
Pure increasing block	0.0	0.0	-	-	-	-	-	-	-	-	-	-
Increasing block; minimum charge; water use	0.0	0.0	-	-	-	-	-	-	-	-	-	-
Increasing block; minimum charge; non-water use	0.0	0.0	-	-	-	-	-	-	-	-	-	-
Other	4.7%	2.2%	-	-	-	-	-	-	-	-	-	-
Not billed separately	95.0%	93.4%										
(Obs.)	(43)	(45)	-	-	-	-	-	-	-	-	-	-

IV.3 EXPENSE DATA

BREAKDOWN OF TOTAL EXPENSES BY OWNERSHIP

(%)

AS EXPECTED, OPERATING EXPENSES (WHICH INCLUDE O&M, DEPRECIATION, OTHER OPERATING EXPENSES, AND, FOR PUBLIC SYSTEMS, PAYMENTS IN LIEU OF TAXES) ARE THE SINGLE LARGEST COMPONENT OF A WATER UTILITY'S EXPENSES. OPERATING EXPENSES GENERALLY ACCOUNT FOR 70-90 PERCENT OF A SYSTEM'S EXPENSES. THIS PERCENTAGE GENERALLY DROPS WITH INCREASING SIZE (MORE CLEARLY FOR THE PRIVATELY OWNED THAN PUBLIC SYSTEMS). THE TAX EXPENSE RATE FOR PRIVATE SYSTEMS, ON THE OTHER HAND, GENERALLY INCREASES WITH INCREASING SYSTEM SIZE.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
PUBLIC												
Total Expenses												
Operating Expenses[1]	95.9%	87.9%	88.1%	91.5%	90.5%	89.6%	88.8%	90.8%	92.7%	87.7%	85.4%	89.3%
Interest	4.1	12.1	11.9	8.5	9.5	10.4	11.2	9.2	7.3	12.3	14.6	10.7
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(12)	(35)	(36)	(36)	(36)	(38)	(38)	(40)	(41)	(42)	(17)	(14)
PRIVATE												
Total Expenses												
Operating Expenses[1]	88.5%	89.3%	84.4%	85.0%	79.4%	77.6%	70.6%	72.1%	76.6%	66.3%	62.8%	59.9%
Taxes[2]	6.9	3.7	4.4	4.6	8.0	12.7	17.9	13.0	10.6	21.4	23.6	26.2
Interest	4.6	7.0	11.2	10.4	12.6	9.7	11.5	14.9	12.8	12.3	13.6	13.9
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(15)	(25)	(15)	(26)	(21)	(27)	(20)	(16)	(8)	(21)	(6)	(1)

[1]Operating Expenses include Operation and Maintenance expense, Depreciation expense, other Operating expenses, and, for public systems, Payments in Lieu of Tax. Operating Expenses does not include Interest expenses or Taxes.

[2]Includes Local, State, and Federal Taxes.

OPERATING EXPENSES BY OWNERSHIP

(¢/1000 gallons produced)

SYSTEMS FROM BOTH OWNERSHIP TYPES EXPERIENCE SIGNIFICANT ECONOMIES OF SCALE IN THEIR OPERATING EXPENSES. THERE IS NOT A SIGNIFICANT DIFFERENCE BETWEEN PUBLIC AND PRIVATELY OWNED SYSTEMS IN THE MEDIUM TO LARGE SIZE CATEGORIES. HOWEVER, SMALL PRIVATELY OWNED SYSTEMS HAVE HIGHER OPERATING EXPENSES THAN SIMILARLY SIZED PUBLIC SYSTEMS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Operating Expenses[2]												
Mean	194.8¢	175.6¢	133.5¢	109.1¢	89.1¢	64.0¢	67.5¢	63.3¢	59.5¢	50.2¢	44.7¢	38.8¢
S.D.	156.7¢	188.4¢	167.3¢	92.9¢	63.2¢	32.5¢	39.3¢	29.6¢	21.3¢	19.6¢	16.8¢	18.2¢
PUBLIC												
Operating Expenses[2]												
Mean	136.7¢	149.6¢	132.1¢	99.5¢	89.4¢	61.0¢	67.8¢	63.9¢	60.2¢	49.0¢	42.7¢	39.2¢
Median	150.9	89.3	76.2	85.5	77.6	54.9	56.6	61.7	58.2	43.2	41.4	32.9
S.D.	148.6¢	190.4¢	178.7¢	68.4¢	65.3¢	30.9¢	39.4¢	30.6¢	22.2¢	19.6¢	15.0¢	18.8¢
(Obs.)	(12)	(33)	(39)	(40)	(45)	(45)	(44)	(46)	(45)	(49)	(19)	(12)
PRIVATE												
Operating Expenses[2]												
Mean	196.5¢	193.7¢	139.6¢	168.3¢	86.4¢	81.0¢	66.4¢	60.8¢	56.2¢	56.3¢	49.5¢	34.7¢
Median	121.5	141.5	122.7	112.9	80.2	76.1	55.8	56.6	54.7	53.2	46.9	34.7
S.D.	158.4¢	185.3¢	106.0¢	180.9¢	41.2¢	39.8¢	39.0¢	25.0¢	16.7¢	19.0¢	20.2¢	0.0
(Obs.)	(15)	(31)	(25)	(28)	(34)	(41)	(31)	(18)	(9)	(25)	(7)	(1)

[1] In the two smallest size categories, these figures do not include ancillary systems which account for 54.8% and 31.4%, respectively, of these sizes.
[2] Operating Expenses include Operation and Maintenance expense, Depreciation expense, Other Operating expenses, and, for public systems, Payments in Lieu of Tax.

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OPERATING EXPENSES BY WATER SOURCE

(¢/1000 gallons produced)

ECONOMIES OF SCALE ARE ALSO EVIDENT IN THE EXAMINATION OF OPERATING EXPENSES BY WATER SOURCE. NO CLEAR DIFFERENCES EMERGE WHEN THE DATA ARE EXAMINED BY WATER SOURCE, HOWEVER.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
PREDOMINANTLY SURFACE WATER												
Operating Expenses[1]												
Mean	12.3¢	66.8¢	69.6¢	95.0¢	93.1¢	69.6¢	65.7¢	62.0¢	51.9¢	52.3¢	42.3¢	36.2¢
Median	12.3	56.9	64.1	103.5	82.0	59.0	56.9	62.6	44.7	48.3	41.4	34.7
S.D.	16.6¢	42.5¢	44.9¢	51.5¢	52.4¢	25.9¢	36.2¢	22.5¢	20.5¢	17.0¢	17.3¢	14.1¢
(Obs.)	(2)	(3)	(5)	(10)	(25)	(22)	(27)	(32)	(20)	(39)	(18)	(11)
PREDOMINANTLY GROUND WATER												
Operating Expenses[1]												
Mean	652.1¢	289.4¢	140.3¢	130.7¢	80.9¢	62.9¢	64.8¢	55.4¢	56.2¢	51.5¢	45.1¢	76.2¢
Median	150.9	124.9	88.9	86.3	75.3	56.2	52.1	54.6	51.8	45.2	38.3	76.2
S.D.	1,679.3¢	448.8¢	162.0¢	147.4¢	57.2¢	30.7¢	42.3¢	20.1¢	17.7¢	23.7¢	13.4¢	0.0¢
(Obs.)	(32)	(68)	(56)	(50)	(46)	(52)	(37)	(14)	(14)	(26)	(5)	(1)
OTHER												
Operating Expenses[1]												
Mean	178.9¢	212.9¢	146.4¢	136.6¢	113.7¢	108.4¢	80.4¢	73.3¢	70.4¢	47.8¢	57.0¢	18.1¢
Median	174.7	128.5	143.5	112.0	100.9	90.5	80.4	62.4	66.6	49.0	52.8	18.1
S.D.	82.0¢	287.3¢	68.9¢	69.8¢	56.8¢	57.2¢	36.5¢	41.8¢	21.7¢	18.7¢	13.5¢	0.0¢
(Obs.)	(4)	(10)	(3)	(7)	(8)	(11)	(10)	(17)	(19)	(9)	(3)	(1)

[1]Operating Expenses include Operation and Maintenance expense, Depreciation expense, Other Operating expenses, and, for public systems, Payments in Lieu of Tax.

BREAKDOWN OF OPERATING EXPENSE BY OWNERSHIP

(%)

OPERATING AND MAINTENANCE (O&M) EXPENSES GENERALLY ACCOUNT FOR 60-80 PERCENT OF THE TOTAL OPERATING EXPENSES OF A WATER UTILITY. DEPRECIATION IS TYPICALLY A LARGER COMPONENT OF EXPENSES IN THE SMALLER SIZES THAN IN THE LARGER SIZES. DEPRECIATION ALSO APPEARS TO BE A HIGHER PERCENTAGE FOR SMALL AND LARGE PRIVATE SYSTEMS THAN FOR SIMILARLY-SIZED PUBLIC SYSTEMS. THIS PHENOMENON IS REVERSED IN THE MIDDLE SIZES.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Operating Expenses[2]												
O&M	61.5%	67.3%	70.3%	67.3%	76.7%	75.6%	73.5%	74.7%	76.9%	77.1%	78.0	75.6%
Depreciation	26.0	13.7	18.5	18.3	13.4	10.8	12.1	10.4	9.5	10.2	12.1	15.8
Other	12.4	19.0	11.2	14.4	9.9	13.6	14.4	14.9	13.6	12.7	9.9	8.6
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
PUBLIC												
Operating Expenses[2]												
O&M	60.7%	70.1%	72.9%	66.7%	76.5%	74.2%	72.3%	74.1%	76.4%	77.0%	78.0%	74.9%
Depreciation	13.2	10.3	16.5	19.1	14.3	11.7	13.1	10.9	9.3	9.9	12.2	16.8
Other	26.1	19.6	10.6	14.2	9.2	14.1	14.6	15.0	14.3	13.0	9.8	8.3
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(12)	(29)	(31)	(28)	(30)	(30)	(36)	(38)	(36)	(40)	(15)	(9)
PRIVATE												
Operating Expenses[2]												
O&M	61.7%	62.9%	59.3%	70.6%	78.4%	83.2%	79.0%	77.1%	79.1%	76.9%	77.8%	86.3%
Depreciation	28.8	18.7	27.0	13.6	5.7	5.9	7.8	8.4	10.6	11.7	12.0	0.0
Other	9.5	18.1	13.9	15.9	15.9	10.9	13.4	14.5	10.3	11.4	10.3	13.7
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(21)	(26)	(21)	(26)	(26)	(34)	(27)	(18)	(8)	(25)	(6)	(1)

[1] In the two smallest size categories, these figures do not include ancillary systems which account for 54.8 percent and 31.4 percent, respectively, of these sizes.

[2] Operating Expenses include Operation and Maintenance expense, Depreciation expense, Other Operating expenses, and, for public systems, Payments in Lieu of Tax.

INTEREST EXPENSES BY OWNERSHIP

(¢/1000 gallons produced)

INTEREST EXPENSE DATA ARE HEAVILY SKEWED BY THE MANY SYSTEMS (PARTICULARLY IN THE SMALLER SIZES) THAT DO NOT HAVE DEBT. WHEN EXAMINING RESULTS FOR ONLY THOSE SYSTEMS THAT HAVE LONG-TERM DEBT, INTEREST EXPENSE PER THOUSAND GALLONS OF PRODUCTION GENERALLY DECLINES WITH INCREASING SYSTEM SIZE. ALSO, IN ALL BUT THE THREE SMALLEST SIZE CATEGORIES, PRIVATELY OWNED SYSTEMS HAVE HIGHER INTEREST EXPENSE RATES THAN DO PUBLIC SYSTEMS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
SYSTEMS WITH AND WITHOUT LONG-TERM DEBT[2]												
ALL SYSTEMS[1]												
Interest Expense												
Mean	11.5¢	27.2¢	20.5¢	14.6¢	10.5¢	9.0¢	11.0¢	9.6¢	5.7¢	9.6¢	9.1¢	5.1¢
PUBLIC												
Interest Expense												
Mean	21.2¢	30.5¢	20.8¢	12.7¢	9.9¢	8.4¢	10.6¢	8.4¢	4.9¢	9.3¢	7.8¢	4.9¢
Median	0.0	6.7	7.4	5.0	4.0	5.8	3.6	5.5	2.9	5.5	4.8	5.3
(Obs.)	(14)	(33)	(34)	(34)	(36)	(30)	(39)	(42)	(42)	(42)	(17)	(10)
PRIVATE												
Interest Expense												
Mean	9.4¢	22.4¢	19.3¢	26.2¢	15.3¢	12.3¢	11.8¢	14.8¢	9.1¢	11.1¢	12.2¢	8.1¢
Median	0.0	0.0	0.0	4.3	10.4	6.3	11.8	10.5	8.4	10.5	10.7	-
(Obs.)	(16)	(26)	(27)	(26)	(29)	(30)	(20)	(16)	(8)	(21)	(6)	(1)
ONLY THOSE SYSTEMS WHICH HAVE LONG-TERM DEBT[2]												
ALL SYSTEMS[1]												
Interest Expense												
Mean	42.4¢[3]	53.5¢	32.0¢	20.3¢	14.4¢	10.5¢	13.0¢	8.5¢	5.0¢	10.5¢	9.1¢	8.1¢
PUBLIC												
Interest Expense												
Mean	99.1¢	50.3¢	30.8¢	18.0¢	14.2¢	9.7¢	13.1¢	9.1¢	5.1¢	10.3¢	7.8¢	5.4¢
Median	117.7	26.1	20.2	8.2	9.2	6.5	5.4	6.0	3.1	6.4	4.8	6.3
(Obs.)	(3)	(20)	(25)	(24)	(25)	(33)	(32)	(39)	(40)	(38)	(17)	(9)
PRIVATE												
Interest Expense												
Mean	30.2¢	58.2¢	37.1¢	34.1¢	17.0¢	15.3¢	12.4¢	15.0¢	9.1¢	11.7¢	12.2¢	8.1¢
Median	27.9	32.7	16.5	16.5	16.6	11.7	12.0	11.2	10.2	11.6	10.8	-
(Obs.)	(5)	(10)	(14)	(20)	(26)	(24)	(19)	(15)	(8)	(20)	(6)	(1)

[1] In the two smallest size categories, these figures do not include ancillary systems which account for 54.0% and 31.4%, respectively, of these sizes.
[2] Long-term debt is defined as debt with over 1 year to maturity.
[3] Small number of observations used to generalize to total population.

IMPLIED INTEREST RATES BY OWNERSHIP

THE IMPLIED INTEREST RATE WAS COMPUTED BY DIVIDING REPORTED INTEREST PAYMENTS BY REPORTED LONG-TERM DEBT. THE RESULTS SHOW VERY LOW RATES IMPLYING THAT MOST OF THE DEBT WAS NOT RECENTLY ACQUIRED. AS EXPECTED, IMPLIED INTEREST RATES OF PRIVATE SYSTEMS ARE HIGHER THAN THOSE OF PUBLIC SYSTEMS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
						ALL SYSTEMS[1]						
Implied Interest Rate												
Mean	4.0%[2]	4.9%	6.9%	7.1%	6.8%	7.0%	6.3%	6.8%	6.1%	6.8%	6.1%	4.6%
						PUBLIC						
Implied Interest Rate												
Mean	5.2%	4.2%	6.4%	7.0%	6.8%	7.5%	5.5%	6.3%	5.5%	6.5%	5.2%	4.4%
Median	4.8	4.4	5.2	5.8	5.2	5.6	5.4	5.1	4.8	5.2	4.9	4.8
(Obs.)	(3)	(12)	(16)	(19)	(19)	(26)	(22)	(30)	(29)	(36)	(15)	(8)
						PRIVATE						
Implied Interest Rate												
Mean	3.7%	5.9%	9.1%	8.1%	7.0%	8.9%	9.9%	8.8%	8.5%	8.3%	8.3%	7.2%
Median	3.7	4.6	6.7	6.4	5.5	9.3	8.8	8.8	7.3	7.8	8.1	7.2
(Obs.)	(2)	(7)	(9)	(10)	(18)	(15)	(14)	(11)	(8)	(15)	(6)	(1)

NOTE: Implied interest rates less than 1% or greater than 30% were excluded. These extremes apparently resulted from delayed interest payments and the occurrence of short-term debts whose interest payments appeared in interest but whose associated obligation did not appear in long-term debt.

[1]In the two smallest size categories, these figures do not include ancillary systems which account for 54.8 percent and 31.4 percent of these sizes, respectively.

[2]Small number of observations used to generalize to total population.

IV.4 FINANCIAL PERFORMANCE DATA

OPERATING MARGIN BY OWNERSHIP

(%)

WHILE PRIVATE SYSTEM OPERATING MARGINS GENERALLY IMPROVE WITH SYSTEM SIZE, THIS RELATIONSHIP DOES NOT APPEAR AS STRONG AMONG PUBLIC SYSTEMS. EXCEPT IN THE SMALLEST SIZE CATEGORIES, PRIVATE SYSTEMS HAVE HIGHER OPERATING MARGINS THAN PUBLIC SYSTEMS. IT IS ALSO IMPORTANT TO NOTE THE LARGE STANDARD DEVIATIONS OF THE SAMPLE, REFLECTING THE WIDE RANGE OF PERFORMANCE OF WATER UTILITIES. THESE FINDINGS ARE CONSISTENT WITH OTHER RESULTS SHOWING HIGHER OPERATING EXPENSES AMONG SMALL PRIVATE SYSTEMS AND HIGHER REVENUES AMONG MEDIUM AND LARGE SIZED PRIVATE SYSTEMS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Operating Margin[2]												
Mean	4.4%	-0.6%	4.5%	1.9%	6.1%	12.0%	15.1%	11.8%	16.9%	20.3%	29.6%	19.6%
S.D.	74.2	61.6	32.0	36.8	36.6	26.9	24.9	24.9	19.7	30.2	17.1	25.8
PUBLIC												
Operating Margin[2]												
Mean	14.1%	3.7%	5.1%	0.0%	4.2%	9.9%	9.9%	6.6%	13.0%	19.0%	21.6%	10.5%
Median	11.0	18.7	5.8	4.5	8.8	15.4	16.1	9.6	11.2	15.8	17.5	12.5
S.D.	24.8%	58.3%	33.0%	38.2%	38.1%	27.5%	26.8%	26.3%	20.6%	18.0%	18.2%	10.9%
(Obs.)	(9)	(30)	(41)	(43)	(44)	(44)	(45)	(46)	(45)	(47)	(18)	(11)
PRIVATE												
Operating Margin[2]												
Mean	2.3%	-7.1%	2.2%	15.4%	22.9%	24.0%	37.6%	34.3%	34.1%	26.9%	49.1%	48.8%
Median	7.9	6.3	6.3	17.9	24.0	28.5	37.7	35.5	38.4	38.7	47.2	48.8
S.D.	81.0%	66.1%	27.2%	25.7%	17.6%	22.6%	12.7%	16.0%	13.7%	62.5%	12.6%	0.0%
(Obs.)	(24)	(36)	(29)	(34)	(36)	(41)	(32)	(18)	(9)	(25)	(6)	(1)

[1]In the two smallest size categories, these figures do not include ancillary systems which account for 54.8% and 31.4% respectively of these sizes.
[2]Operating margin is defined as Revenues minus Operating Expenses divided by Revenues. The figure is computed only for those systems that charge directly for water.

SURPLUS/DEFICIT AND PROFIT/LOSS BY OWNERSHIP

(¢/1000 gallons produced)

EXAMINATION OF THE DATA IMPLIES THAT PRIVATE SYSTEMS ARE MORE PROFITABLE THAN PUBLIC SYSTEMS, EXCEPT IN SOME OF THE SMALLER SIZE CATEGORIES. IN ADDITION SMALLER SYSTEMS TEND TO HAVE LARGER LOSSES MEASURED ON A CENTS PER THOUSAND GALLON BASIS THAN DO LARGER SYSTEMS WHILE PROFITABILITY REMAINS RELATIVELY FLAT FOR ALL SYSTEMS ABOVE THE 3,301 SIZE. IT IS IMPORTANT TO NOTE THAT IT IS DIFFICULT TO COMPARE PRIVATE SYSTEMS' PROFIT/LOSS TO PUBLIC SYSTEMS' SURPLUS/DEFICIT DUE TO ACCOUNTING DIFFERENCES (ESPECIALLY WHERE PUBLIC SYSTEMS SUBTRACT BOTH INTEREST AND PRINCIPAL TO ARRIVE AT SURPLUS/DEFICIT) AND THE FACT THAT PUBLIC SYSTEMS MAY EITHER RECEIVE MONEY FROM OR SUPPLY MONEY TO THE LOCAL MUNICIPALITY.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
PUBLIC												
Reported Surplus/Deficit[1]												
Mean Reported Surplus	-17.6¢	0.2¢	-12.0¢	-5.3¢	7.6¢	5.0¢	3.1¢	6.7¢	7.7¢	9.3¢	5.8¢	7.5¢
Median Reported Surplus	4.2	2.3	3.6	-2.3	1.6	4.8	2.3	4.5	4.2	4.2	4.7	2.0
Range	(-178.6 to 100)	(-102.0 to 91.8)	(-472.3 to 227.7)	(-81.0 to 60.6)	(-49.9 to 83.0)	(-35.9 to 45.9)	(-45.5 to 62.6)	(-20.1 to 75.0)	(-20.0 to 79.1)	(-7.8 to 60.5)	(-3.6 to 19.5)	(-0.6 to 28.5)
(Obs.)	(4)	(25)	(29)	(31)	(32)	(33)	(34)	(30)	(39)	(31)	(15)	(11)
PRIVATE												
Reported Profit/Loss[2]												
Mean Reported Surplus	15.0¢	-21.1¢	-1.5¢	-6.1¢	8.6¢	9.5¢	11.6¢	10.1¢	14.6¢	11.7¢	12.1¢	9.8¢
Median Reported Surplus	11.0	3.4	-3.1	2.7	6.4	6.9	11.7	10.1	12.0	10.3	9.9	-
Range	(-54.3 to 153.9)	(-453.6 to 189.3)	(-104.1 to 125.2)	(-210.1 to 63.8)	(-27.6 to 45.2)	(-93.2 to 58.6)	(-13.8 to 34.4)	(-18.7 to 37.3)	(0.8 to 41.4)	(-6.1 to 40.0)	(4.3 to 22.3)	-
(Obs.)	(14)	(27)	(22)	(24)	(29)	(31)	(21)	(17)	(8)	(23)	(7)	(1)

NOTE: Computed only for systems that charge directly for water.

[1]Surplus/Deficit is defined as revenues minus operating expenses minus interest (and principal if the system uses enterprise fund accounting).
[2]Profit/Loss is defined as revenues minus operating expenses minus interest minus taxes.

ANCILLARY SYSTEM INCOME STATEMENT DATA

A SIGNIFICANT PORTION OF THE SAMPLE EITHER REFUSED TO ANSWER OR DID NOT KNOW PROFIT/LOSS OF THE PRIMARY BUSINESS. OF THOSE THAT DID ANSWER, THE DATA SHOW MOST ENTITIES EITHER WITH A LOSS OR A PROFIT OF LESS THAN $10,000.

PROFIT/LOSS OF PRIMARY BUSINESS

	POPULATION CATEGORY	
	25-100	101-500
Profit/Loss (percent reporting)		
Loss	25.8%	34.8%
0-$10,000	45.2	34.8
$10,000-50,000	25.8	26.1
$50,000-100,000	0.0	4.3
$100,000-250,000	3.2	0.0
Total	100%	100%
(Obs.)	(31)	(23)

V. ASSETS AND LIABILITIES

V.1 ASSETS

V.2 LIABILITIES

V.3 CAPITAL EXPENDITURES

V.4 ANCILLARY SYSTEM ASSETS AND LIABILITIES

TOTAL NET ASSETS BY OWNERSHIP

($000)

PUBLIC SYSTEM TOTAL NET ASSETS ARE LARGER THAN PRIVATE SYSTEM NET ASSETS IN NEARLY ALL SIZE CATEGORIES. ONE POSSIBLE EXPLANATION IS THE LESS FREQUENT USE OF DEPRECIATION ACCOUNTING AMONG PUBLIC SYSTEMS, ESPECIALLY IN SMALLER SIZE CATEGORIES.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Total Net Assets[2]												
Mean	$37.8	$202.8	$299.8	$775.9	$1,915.8	$5,450.5	$9,996.7	$27,021.9	$24,185.6	$54,337.5	$193,413.4	$540,735.6
S.D.	40.2	199.2	271.1	747.9	1,619.9	3,576.0	7,738.6	22,151.6	15,914.4	39,586.1	147,599.7	527,489.7
PUBLIC												
Total Net Assets[2]												
Mean	$54.8	$261.1	$320.1	$814.2	$1,977.7	$5,823.0	$10,388.9	$29,924.9	$25,350.0	$56,313.1	$188,893.6	$567,438.5
Median	38.7	180.0	243.5	562.8	1,552.8	5,114.9	8,677.2	16,648.9	22,948.5	43,812.3	146,800.0	468,099.1
S.D.	$63.3	$223.8	$259.7	$778.5	$1,682.2	$3,867.6	$7,914.1	$24,483.5	$17,433.5	$42,339.4	$118,516.8	$544,934.4
(Obs.)	(12)	(21)	(30)	(32)	(33)	(39)	(37)	(43)	(40)	(40)	(15)	(11)
PRIVATE												
Total Net Assets[2]												
Mean	$34.2	$116.0	$213.0	$540.4	$1,377.1	$3,339.4	$8,302.9	$14,483.2	$19,021.9	$44,192.7	$204,425.5	$143,583.0
Median	24.0	54.3	124.8	387.0	1,140.6	2,725.0	6,105.3	15,604.5	18,952.9	39,538.4	144,145.0	143,583.0
S.D.	$33.1	$155.0	$315.0	$522.0	$911.8	$694.1	$6,929.3	$4,578.1	$5,348.2	$20,217.6	$201,599.1	$0.0
(Obs.)	(18)	(31)	(22)	(29)	(28)	(31)	(22)	(16)	(8)	(19)	(7)	(1)

[1]In the two smallest size categories, these figures do not include ancillary systems which account for 54.8 percent and 31.4 percent, respectively, of these sizes.

[2]Total Net Assets include Current Assets, Net Plant and Equipment (Gross Plant and Equipment minus Accumulated Depreciation), and Other Assets.

V.1 ASSETS

TOTAL NET ASSETS BY WATER SOURCE

($000)

GROUND WATER SYSTEMS GENERALLY SHOW A LOWER LEVEL OF TOTAL ASSETS THAN EITHER SURFACE WATER SYSTEMS OR "OTHER" SYSTEMS (LARGELY SYSTEMS THAT RELY ON PURCHASED WATER).

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
PREDOMINANTLY SURFACE WATER												
Total Net Assets[1]												
Mean	$376.9	$295.0	$245.6	$325.2	$1,715.2	$5,102.0	$10,421.6	$24,634.5	$26,094.1	$58,037.1	$220,331.7	$559,893.9
Median	376.9	295.0	200.7	264.3	1,282.1	4,190.2	7,893.9	16,648.9	21,280.5	49,557.2	150,299.8	441,870.5
S.D.	$357.9	$ 0.0	$228.1	$234.2	$1,479.1	$3,959.0	$ 8,880.2	$27,252.8	$15,947.9	$36,904.1	$170,492.1	$561,582.8
(Obs.)	(2)	(1)	(5)	(5)	(19)	(21)	(21)	(31)	(18)	(31)	(14)	(10)
PREDOMINANTLY GROUND WATER												
Total Net Assets[1]												
Mean	$31.5	$147.5	$279.4	$736.0	$1,698.0	$4,706.3	$9,244.4	$14,543.5	$22,780.7	$50,251.2	$143,322.3	$746,467.0
Median	19.5	83.5	147.4	467.3	1,240.4	3,946.6	6,481.2	13,777.8	18,498.3	37,074.9	124,073.4	746,467.0
S.D.	$41.6	$185.3	$299.3	$754.1	$1,446.9	$3,378.4	$7,846.3	$ 6,234.3	$22,104.4	$39,412.9	$ 75,695.3	$ 0.0
(Obs.)	(40)	(57)	(44)	(44)	(34)	(39)	(27)	(13)	(13)	(22)	(5)	(1)
OTHER												
Total Net Assets[1]												
Mean	$39.6	$294.7	$514.9	$561.5	$2,322.7	$3,649.4	$9,268.6	$17,562.7	$23,021.7	$31,251.2	$152,042.5	$40,000.0
Median	46.1	352.3	514.9	509.0	2,283.8	3,597.5	8,874.0	11,467.7	23,267.5	24,369.3	142,798.0	40,000.0
S.D.	$25.7	$178.6	0.0	$350.3	$1,413.3	$2,181.2	$4,029.4	$13,757.7	$11,431.4	$19,563.6	$ 79,541.1	$ 0.0
(Obs.)	(4)	(6)	(1)	(7)	(4)	(8)	(8)	(14)	(16)	(6)	(3)	(1)

[1]Total Net Assets includes Current Assets, Total Net Plant and Equipment (Gross Plant and Equipment minus Accumulated Depreciation), and Other Assets.

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TOTAL NET ASSETS PER CONNECTION BY OWNERSHIP

($/connection)

TOTAL NET ASSETS PER CONNECTION ARE RELATIVELY FLAT AT $900-$1,100 PER CONNECTION FOR THOSE SYSTEMS SERVING MORE THAN 501 PEOPLE. SMALLER SYSTEMS, HOWEVER, REPORT FIGURES THAT ARE SIGNIFICANTLY HIGHER. WHEN THE FIGURES ARE EXAMINED FOR DIFFERENCES BY OWNERSHIP, THE DATA SHOW PUBLIC SYSTEMS WITH CONSISTENTLY HIGHER ASSETS IN EVERY CATEGORY AS WELL AS IN THE TOTAL. AS EXPECTED, GROSS ASSETS REQUIRED FOR DISTRIBUTION ARE MUCH LARGER THAN THOSE REQUIRED FOR PRODUCTION/TREATMENT OR "OTHER." IN ALL BUT THE SMALLEST AND LARGEST SIZES, DISTRIBUTION ASSETS ARE APPROXIMATELY THREE TIMES THE AMOUNT (ON A DOLLAR PER CONNECTION BASIS) OF PRODUCTION/TREATMENT ASSETS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Assets/Connection												
Production/treatment	$297.6	$ 841.6	$163.2	$259.2	$345.8	$212.1	$202.0	$258.2	$227.7	$298.8	$236.9	$635.9
Distribution	540.4	1,681.4	674.4	794.5	822.1	623.7	954.5	798.6	705.7	643.5	689.4	786.0
Other Plant & Equipment	141.2	80.8	132.9	83.0	44.8	154.0	91.8	174.9	40.1	84.2	105.7	168.9
Total Gross Plant	909.2	1,688.9	895.5	1,158.5	1,098.6	944.6	1,188.8	1,156.1	997.3	1,027.5	1,094.3	1,318.2
Total Net Plant	903.1	1,448.4	793.0	966.7	901.3	787.5	946.9	989.6	843.8	735.4	838.2	835.4
Total Net Assets[2]	$1,385.6	$1,569.4	$975.4	$1,194.5	$979.5	$967.1	$1,021.3	$1,304.2	$1,042.5	$989.3	$1,162.0	$1,025.5
PUBLIC												
Assets/Connection												
Production/Treatment	$447.6	$1,300.6	$ 168.9	$ 252.4	$ 354.3	$218.6	$ 206.7	$ 267.8	$ 238.2	$ 324.9	$ 272.7	$ 673.3
Distribution	523.4	2,304.6	665.4	831.2	817.6	568.2	1,045.6	825.5	763.6	646.5	737.1	814.4
Other Plant & Equipment	0.0	46.1	153.4	82.3	46.3	155.5	221.4	202.4	41.0	85.3	117.4	176.4
Total Gross Plant	1,057.9	2,112.1	894.3	1,225.2	1,114.6	929.0	1,288.8	1,214.7	1,048.1	1,067.3	1,196.9	1,373.2
Total Net Plant	964.7	1,818.0	809.7	1,018.1	922.0	790.9	1,034.1	1,047.5	894.2	747.7	905.7	864.6
Total Net Assets[2]	$3,395.6	$1,889.1	$1,006.8	$1,264.8	$1,003.3	$986.7	$1,101.5	$1,409.2	$1,110.3	$1,030.7	$1,217.6	$1,066.6
(Obs.)	(3-10)	(11-21)	(11-33)	(17-34)	(18-33)	(24-39)	(16-36)	(27-42)	(15-39)	(29-39)	(12-14)	(4-8)
PRIVATE												
Assets/Connection												
Production/Treatment	$ 265.3	$ 158.9	$ 139.0	$ 300.8	$ 271.8	$ 175.5	$ 181.7	$ 216.5	$ 180.9	$ 164.8	$ 149.7	$ 80.0
Distribution	544.0	754.3	755.3	568.7	861.3	937.2	561.1	682.6	448.8	628.4	573.2	364.2
Other Plant & Equipment	171.6	132.4	45.6	87.4	31.7	145.2	63.9	56.1	35.9	78.8	77.3	56.6
Total Gross Plant	877.2	1,059.4	900.4	748.8	959.1	1,032.6	757.1	903.1	771.8	823.2	844.2	500.8
Total Net Plant	889.8	898.6	721.9	651.3	721.2	767.9	570.3	739.6	620.2	672.4	673.6	400.5
Total Net Assets[2]	$953.3	$1,093.9	$841.5	$762.8	$772.7	$856.1	$675.1	$850.6	$741.8	$777.0	$1,026.4	$414.8
(Obs.)	(12-22)	(11-31)	(7-22)	(13-29)	(10-28)	(17-32)	(19-24)	(10-18)	(3-8)	(17-22)	(5-7)	(1)

Note: Numbers do not add to total because each line item was figured separately. Also, wholesalers and special situations (e.g., schools, prisons) are excluded from calculation.

[1]In the two smallest size categories, these figures do not include ancillary systems which account for 54.8 percent and 31.4 percent, respectively, of these sizes.

[2]Total Net Assets includes Current Assets, Net Plant and Equipment ("Net Plant") and Other Assets.

BREAKDOWN OF TOTAL NET ASSETS BY OWNERSHIP

BOTH PUBLIC AND PRIVATELY OWNED SYSTEMS TEND TO HOLD 80-90 PERCENT OF THEIR ASSETS IN THE FORM OF NET PLANT AND EQUIPMENT. AMONG SYSTEMS SERVING OVER 3,301 PEOPLE, THE PRIVATELY OWNED SYSTEMS APPEAR TO HAVE A SLIGHTLY HIGHER PROPORTION OF PLANT ASSETS THAN PUBLIC SYSTEMS, WHILE PUBLIC SYSTEMS HAVE A HIGHER PERCENTAGE OF CURRENT ASSETS. THE PERCENTAGES ARE QUITE SIMILAR ACROSS ALL SIZE CATEGORIES.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Percent of Total Net Assets												
Current Assets	15.8%	10.8%	13.7%	11.6%	13.9%	13.5%	11.0%	11.5%	11.7%	11.0%	12.4%	7.5%
Net P&E	82.5	84.9	80.8	82.6	80.4	81.2	81.3	82.1	82.5	74.1	81.2	80.9
Other Assets	1.7	4.3	5.5	5.8	5.7	5.3	7.7	6.4	5.8	14.9	6.4	11.6
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
PUBLIC												
Percent of Total Net Assets												
Current Assets	8.9%	7.1%	14.6%	12.0%	14.3%	14.3%	11.2%	11.9%	13.2%	11.8%	13.9%	7.9%
Net P&E	87.8	88.0	80.6	82.0	79.8	79.7	79.9	80.6	82.0	71.5	78.4	79.8
Other Assets	3.3	4.9	4.8	6.0	5.9	6.0	8.9	7.5	4.8	16.7	7.7	12.3
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(10)	(16)	(23)	(25)	(25)	(37)	(32)	(39)	(19)	(29)	(12)	(8)
PRIVATE												
Percent of Total Net Assets												
Current Assets	17.3%	16.2%	9.6%	9.1%	10.7%	9.2%	10.2%	10.0%	5.2%	6.7%	8.6%	1.9%
Net P&E	81.3	80.4	81.8	86.2	85.0	89.2	87.2	88.3	84.7	87.4	88.3	96.5
Other Assets	1.4	3.4	8.6	4.7	4.3	1.6	2.4	1.7	10.1	5.9	3.1	1.6
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(14)	(25)	(18)	(25)	(26)	(26)	(19)	(16)	(7)	(18)	(6)	(1)

[1] In the two smallest size categories, these figures do not include ancillary systems, which account for 54.8 percent and 31.4 percent, respectively, of these sizes.

GROSS ASSETS/AVERAGE DAILY PRODUCTION BY OWNERSHIP

($/gallons per day)

BOTH PUBLIC AND PRIVATE SYSTEMS ILLUSTRATE ECONOMIES OF SCALE WITH INCREASING SIZE. NO FURTHER ECONOMIES OCCUR FOR PUBLIC SYSTEMS ABOVE 75,000 PEOPLE SERVED AND FOR PRIVATE SYSTEMS ABOVE 25,001 PEOPLE SERVED. IN SMALL SIZE CATEGORIES, PUBLIC SYSTEMS REQUIRE MORE ASSETS PER UNIT OF PRODUCTION THAN DO PRIVATE SYSTEMS. AS WITH TOTAL ASSETS, A POSSIBLE EXPLANATION IS THE DIFFERENCE IN ACCOUNTING PRACTICES WITH RESPECT TO DEPRECIATION.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Gross Assets/Production[2]												
Mean	$5.5	$9.0	$4.0	$4.0	$3.2	$1.9	$2.5	$2.0	$1.5	$1.6	$1.4	$1.4
S.D.	4.5	15.0	4.2	4.1	4.3	1.2	2.9	1.3	0.8	1.0	0.6	0.9
PUBLIC												
Gross Assets/Production[2]												
Mean	$9.2	$11.5	$4.1	$4.2	$3.3	$1.9	$2.7	$2.0	$1.5	$1.6	$1.4	$1.4
Median	6.3	4.8	2.9	2.8	2.2	1.7	1.7	1.7	1.3	1.5	1.3	1.2
S.D.	$9.3	$19.0	$4.3	$4.3	$4.5	$1.2	$3.1	$1.3	$0.9	$1.0	$0.7	$0.9
(Obs)	(10)	(21)	(33)	(31)	(30)	(38)	(32)	(41)	(35)	(41)	(16)	(12)
PRIVATE												
Gross Assets/Production[2]												
Mean	$4.7	$5.4	$3.4	$2.9	$2.2	$1.9	$1.6	$1.8	$1.3	$1.5	$1.4	$1.3
Median	4.3	3.8	2.8	2.5	1.8	1.7	1.6	1.5	1.3	1.4	1.4	1.3
S.D.	$2.2	$5.1	$3.3	$2.4	$1.8	$1.2	$0.9	$1.3	$0.2	$0.6	$0.5	$0.0
(Obs)	(16)	(26)	(20)	(27)	(23)	(32)	(24)	(18)	(8)	(22)	(6)	(1)

[1]In the two smalles size categories, these figures do not include ancillary systems which account for 54.8 percent and 31.4 percent, respectively, of these sizes.

[2]Gross Assets is defined as Gross Plant and Equipment (Production-Treatment, Distribution, Other) before depreciation.

GROSS ASSETS/UNIT OF PRODUCTION BY WATER SOURCE

SMALLER SYSTEMS GENERALLY SHOW HIGHER DOLLARS OF ASSETS PER UNIT OF PRODUCTION THAN DO LARGER SYSTEMS, ILLUSTRATING ECONOMIES OF SCALE OF PRODUCTION, TREATMENT, AND DISTRIBUTION SYSTEMS. NO CONSISTENT DIFFERENCES BASED ON WATER SOURCE EMERGE FROM THE DATA.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
PREDOMINANTLY SURFACE WATER												
Gross Assets/Production[1]												
Mean	$8.4	$1.1	$2.7	$3.3	$2.7	$1.9	$2.8	$2.3	$1.5	$1.7	$1.5	$1.4
Median	8.4	1.1	1.1	3.3	2.4	1.8	1.7	2.1	1.4	1.6	1.3	1.2
S.D.	$0.0	$0.0	$3.8	$2.4	$1.9	$1.0	$3.6	$1.4	$0.7	$1.0	$0.7	$0.9
(Obs.)	(1)	(1)	(5)	(6)	(16)	(22)	(22)	(29)	(17)	(34)	(14)	(12)
PREDOMINANTLY GROUND WATER												
Gross Assets/Production[1]												
Mean	$5.7	$8.1	$3.9	$3.5	$2.9	$1.9	$2.0	$1.6	$1.2	$1.5	$1.3	$1.9
Median	4.3	4.2	2.9	2.4	1.8	1.6	1.7	1.4	1.0	1.3	1.3	1.9
S.D.	$5.3	$14.4	$3.9	$3.7	$4.4	$1.3	$1.5	$1.1	$0.6	$0.7	$0.5	$0.0
(Obs.)	(20)	(39)	(47)	(44)	(33)	(39)	(25)	(16)	(11)	(23)	(5)	(1)
OTHER												
Gross Assets/Production[1]												
Mean	$8.9	$9.5	$8.7	$4.5	$2.6	$1.9	$1.6	$1.5	$1.5	$1.2	$1.0	-
Median	6.3	7.6	8.7	3.1	1.9	1.9	1.5	1.0	1.3	1.2	1.2	-
S.D.	$10.1	$7.8	$0.0	$3.9	$1.6	$1.2	$0.5	$1.1	$1.1	$0.5	$0.7	-
(Obs.)	(5)	(7)	(1)	(8)	(4)	(8)	(8)	(13)	(14)	(6)	(3)	(0)

[1]Gross Assets is defined as Gross Plant and Equipment (Production-Treatment, Distribution, Other) before depreciation.

V.2 LIABILITIES

BREAKDOWN OF LIABILITIES BY OWNERSHIP

THE EXAMINATION OF LIABILITY CATEGORIES SHOWS LONG-TERM DEBT GENERALLY IN THE RANGE OF 25-45 PERCENT OF TOTAL LIABILITIES FOR BOTH PUBLIC AND PRIVATELY OWNED SYSTEMS. RETAINED EARNINGS OF PRIVATELY OWNED SYSTEMS ARE ALSO RELATIVELY STEADY, IN THE 20-30 PERCENT RANGE. THE "OTHER CAPITAL" CATEGORY FOR PUBLIC SYSTEMS CORRESPONDS ROUGHLY IN AN ACCOUNTING SENSE TO THE "RETAINED EARNINGS," "PAID-IN CAPITAL," AND "OTHER LIABILITIES" CATEGORIES OF THE PRIVATELY OWNED SYSTEMS.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
PUBLIC												
Liability Category												
Current Liabilities	1.2%	11.7%	14.9%	4.6%	6.3%	14.6%	9.7%	8.6%	7.3%	9.0%	6.0%	7.6%
Long-Term Debt[1]	27.8	49.9	33.9	39.0	29.6	29.9	23.7	24.8	22.8	31.9	31.2	44.4
Other Capital	71.0	38.4	51.2	56.4	64.5	55.5	66.6	66.7	70.0	59.0	62.8	48.0
Total Liabilities	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(4)	(12)	(24)	(23)	(25)	(34)	(29)	(36)	(35)	(40)	(15)	(10)
PRIVATE												
Liability Category												
Current Liabilities	15.5%	11.2%	24.5%	16.0%	7.5%	14.1%	15.9%	9.9%	14.3%	12.1%	14.6%	26.0%
Long-Term Debt[1]	25.9	25.3	47.5	30.0	40.7	18.5	29.8	28.4	33.3	38.9	45.4	39.4
Retained Earnings	41.7	28.5	20.4	26.4	21.0	26.8	29.8	29.6	27.0	21.0	19.1	24.6
Paid-In Capital	16.6	15.7	(2.4)	14.7	19.8	18.0	16.2	19.3	17.8	17.1	17.4	10.0
Other Capital	2.3	19.3	10.2	14.8	11.1	19.9	8.4	12.7	7.6	11.0	3.5	0
Total Liabilities	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(12)	(16)	(18)	(23)	(22)	(22)	(17)	(14)	(6)	(13)	(5)	(1)

[1]Long-Term Debt is defined as debt with over one year to maturity.

LONG-TERM DEBT EXPENSE BY OWNERSHIP

OVER ONE HALF OF ALL PUBLIC AND PRIVATELY OWNED SYSTEMS SERVING MORE THAN 500 PEOPLE HAVE AT LEAST SOME LONG-TERM DEBT. IN MOST SIZE CATEGORIES, PUBLIC SYSTEMS ARE MORE LIKELY TO HAVE LONG-TERM DEBT THAN ARE PRIVATELY OWNED SYSTEMS. ALSO, IN MOST SIZE CATEGORIES THE PUBLIC SYSTEMS REPORT LESS DEBT (MEASURED IN DOLLARS PER GALLON OF AVERAGE DAILY PRODUCTION) THAN DO PRIVATE SYSTEMS.

	POPULATION CATEGORY										
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
Percent with Long-Term Debt												
Public	20.0%	46.2%	62.2%	69.4%	75.0%	85.4%	79.4%	90.2%	87.5%	90.2%	100.0%	100.0%
Private	25.0	42.0	54.8	51.9	75.9	70.4	94.4	80.0	100.0	88.2	100.0	100.0
All Systems[1]	24.1%	44.5%	60.8%	67.0%	75.1%	83.2%	82.2%	88.3%	89.8%	89.9%	100.0%	100.0%
						ALL SYSTEMS[1]						
Amount of Long-Term Debt ($/gallon average daily production)												
Mean	$4.2[2]	$3.6	$2.4	$2.0	$1.0	$0.7	$0.9	$0.7	$0.4	$0.7	$0.5	$0.6
S.D.	2.9[2]	4.5	2.9	2.2	1.0	0.8	1.8	1.2	0.5	0.8	0.6	0.6
						PUBLIC						
Amount of Long-Term Debt ($/gallon average daily production)												
Mean	$7.0	$3.5	$2.5	$1.9	$1.0	$0.7	$1.0	$0.6	$0.4	$0.7	$0.5	$0.6
Median	7.0	2.8	2.3	1.1	0.8	0.3	0.3	0.4	0.3	0.5	0.3	0.5
S.D.	$4.9	$3.2	$2.7	$2.1	$1.0	$0.8	$1.9	$1.0	$0.5	$0.9	$0.6	$0.6
(Obs.)	(2)	(9)	(19)	(17)	(21)	(29)	(24)	(34)	(32)	(36)	(15)	(10)
						PRIVATE						
Amount of Long-Term Debt ($/gallon average daily production)												
Mean	$3.6	$3.8	$2.2	$2.6	$1.1	$0.5	$0.4	$0.9	$0.4	$0.6	$0.6	$0.4
Median	4.2	2.9	0.6	2.0	0.7	0.3	0.4	0.5	0.4	0.6	0.6	0.4
S.D.	$1.9	$5.9	$2.8	$2.2	$1.1	$0.6	$0.3	$1.5	$0.1	$0.2	$0.3	$0.0
(Obs.)	(4)	(12)	(13)	(11)	(19)	(19)	(17)	(12)	(8)	(15)	(6)	(1)

NOTE: "Amount of long-term debt" is calculated only for those systems reporting some long-term debt. Long-term debt is defined as debt with over one year to maturity.

[1] In the two smallest size categories, these figures do not include ancillary systems which account for 54.8% and 31.4%, respectively, of these sizes.

[2] Small number of observations used to generalize to total population.

V.3 CAPITAL EXPENDITURES

CAPITAL EXPENDITURES FOR WATER QUALITY IMPROVEMENT FOR ALL SYSTEMS

WHILE SMALLER SYSTEMS IN ALL OWNERSHIP CATEGORIES ARE SLIGHTLY LESS LIKELY TO HAVE MADE MAJOR CAPITAL EXPENDITURES TO IMPROVE WATER QUALITY SINCE 1975, THIS PATTERN IS PRONOUNCED AMONG PRIVATE SYSTEMS. SIZE ALSO RELATES TO THE TYPE OF EXPENDITURE, WITH SMALLER SYSTEMS PURCHASING MORE CHLORINATION EQUIPMENT AND LARGER SYSTEMS MORE FILTRATION EQUIPMENT. THESE PATTERNS ARE REFLECTED IN THE WATER QUALITY IMPROVEMENTS. THE LARGE "OTHER" IMPROVEMENT INCLUDES MANY ANSWERS OF NO IMPROVEMENT AND IMPROVEMENT IN TASTE, ODOR, OR COLOR. NO CLEAR PATTERN EMERGES FOR "REASON FOR MAKING IMPROVEMENT." THE "OTHER" RESPONSE PRIMARILY REFLECTS ANSWERS RELATING TO EXPANSION.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER[2] 1,000,000
Percent Making CE Since 1975												
Public	40.0%	38.0%	40.0%	30.0%	44.0%	36.0%	32.0%	48.0%	36.0%	36.0%	55.0%	71.4%
Private	17.6	28.0	26.0	34.0	28.0	42.0	45.0	45.0	33.0	69.2	42.9	0.0
All Systems[1]	21.6%	34.0%	37.3%	30.6%	42.4%	36.9%	34.4%	47.4%	35.5%	41.4%	51.5%	71.4%
	ALL SYSTEMS[1]											
Major Uses												
Chlorination	47.5%	53.9%	60.3%	48.4%	46.7%	48.2%	45.9%	40.1%	39.4%	41.6%	32.3%	40.0%
Other Disinfection	0.0	0.0	4.1	0.0	4.8	0.7	9.2	3.4	6.1	6.5	0.0	10.0
Filtration	16.3	9.1	16.2	26.3	22.6	20.6	4.7	57.3	42.4	44.4	67.7	40.0
Other[3]	37.5%	54.4%	36.0%	41.0%	37.1%	53.0%	31.6%	21.1%	37.4%	47.3%	54.8%	40.0%
Major Improvements in Water Quality												
Coliform	48.7%	51.0%	61.4%	30.4%	46.7%	66.4%	39.9%	30.0%	33.3%	26.7%	32.3%	20.0%
Turbidity	20.1	21.2	19.1	44.3	43.3	40.2	27.6	47.6	42.4	44.4	35.5	60.0
Other[3]	10.2%	55.0%	43.8%	50.8%	52.6%	30.9%	61.1%	68.0%	75.9%	54.7%	80.6%	30.0%
Reason for Improvement												
Regulation	61.2%	35.3%	44.9%	39.3%	32.2%	35.9%	36.6%	49.8%	37.9%	45.5%	41.9%	30.0%
Upgrade/Replacement	22.6	64.7	40.0	56.6	51.5	56.0	53.1	39.7	36.5	49.1	15.5	60.0
Other[3]	16.3%	17.5%	12.5%	12.3%	22.6%	15.6%	20.4%	28.6%	27.2%	21.2%	51.7%	10.0%

NOTE: Multiple answers allowed so totals exceed 100%.

[1] In the two smallest size categories, these figures do not include ancillary systems which account for 54.8 percent and 31.4 percent, respectively, of these sizes.

[2] This data covers public systems only as the one private system made no capital expenditures (public systems comprise 98.5% of all systems in this size category).

[3] Included in these answers are many capital expenditures which are not treatment-related (e.g., pumps). These responses were allowed to stand to gain information concerning source of financing, etc.

FINANCING OF CAPITAL EXPENDITURES BY OWNERSHIP

(percent using method)

PUBLIC SYSTEMS RELY HEAVILY ON REVENUE BONDS, CAPITAL RESERVE FUNDS AND "OTHER" METHODS OF FINANCING CAPITAL EXPENDITURES. SIMILARLY, PRIVATE SYSTEMS RELY ON BANK LOANS, CAPITAL RESERVE FUNDS, AND WORKING CAPITAL. FARMERS HOME ADMINISTRATION GRANTS AND LOANS WERE USED BY A SIGNIFICANT PERCENTAGE OF PUBLIC SYSTEMS SERVING LESS THAN 3,300 PEOPLE.

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000
PUBLIC												
Financing of CE												
Revenue Bond	7.1%	0.0%	20.0%	13.3%	27.3%	22.2%	18.7%	12.5%	22.2%	50.0%	27.3%	30.0%
General Obligation Bond	0.0	0.0	5.0	6.7	13.6	11.1	18.7	29.2	27.8	11.1	18.2	20.0
Bank Loan	0.0	21.1	5.0	6.7	9.0	0.0	0.0	0.0	0.0	5.6	0.0	10.0
Capital Reserve Fund	21.4	21.1	30.0	20.0	36.4	38.9	37.5	45.8	55.6	44.4	45.5	20.0
Special Assessment	0.0	10.5	10.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0
Working Capital	0.0	0.0	10.0	6.7	13.6	16.7	6.2	12.5	5.6	11.1	18.2	30.0
FmHA Grant/Loan	14.2	26.3	10.0	20.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	57.2	36.9	25.0	33.3	4.5	16.7	25.0	20.8	11.1	11.1	9.1	20.0
Unsure	0.0%	0.0%	0.0%	0.0%	4.5%	0.0%	6.2%	4.2%	5.6%	0.0%	0.0%	0.0%
(Obs.)	(14)	(19)	(20)	(15)	(22)	(18)	(16)	(24)	(18)	(18)	(11)	(10)
PRIVATE												
Financing of CE												
Bank Loan	0.0%	7.1%	23.1%	29.4%	35.7%	23.8%	16.7%	11.1%	0.0%	27.8%	0.0%	0.0%
Company Bonds	0.0	0.0	0.0	0.0	0.0	0.0	16.7	22.2	0.0	27.8	33.3	0.0
Industrial Revenue Bonds	0.0	0.0	0.0	0.0	6.7	0.0	5.6	11.1	0.0	11.1	0.0	0.0
Capital Reserve Fund	16.7	57.1	53.8	17.6	35.7	38.1	33.3	44.4	33.3	33.3	66.7	0.0
Special Assessment	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stock Issue	0.0	0.0	0.0	0.0	0.0	0.0	11.1	22.2	0.0	0.0	0.0	0.0
Working Capital	50.0	21.4	7.7	5.9	6.7	4.8	16.7	0.0	66.7	10.5	0.0	0.0
FmHA Grant/Loan	0.0	0.0	7.7	12.5	6.7	4.8	0.0	0.0	0.0	0.0	0.0	0.0
Other	16.7	14.3	7.7	28.7	15.2	14.2	0.0	22.2	0.0	10.5	0.0	0.0
Unsure	0.0%	0.0%	7.7%	5.9%	0.0%	9.5%	16.7%	0.0%	0.0%	0.0%	0.0%	0.0%
(Obs.)	(6)	(14)	(13)	(16)	(15)	(21)	(18)	(9)	(3)	(19)	(3)	(0)

Note: Multiple answers allowed.

BOND RATINGS BY OWNERSHIP

SYSTEMS SERVING MORE THAN 10,000 PEOPLE TYPICALLY HAVE ISSUED BONDS WITH ALMOST ALL OF THE LARGEST SYSTEMS HAVING DONE SO. A SIGNIFICANTLY SMALLER PERCENTAGE OF PRIVATE SYSTEMS HAVE ISSUED BONDS THAN HAVE PUBLIC SYSTEMS. ALSO, THE DATA SHOW THAT THE SMALLER SYSTEMS THAT ARE RATED TEND TO HAVE HIGHER RATINGS.

	POPULATION CATEGORY											
	25-100[2]	101-500[2]	501-1,000[2]	1,001-3,300[2]	3,301-10,000[2]	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
ALL SYSTEMS[1]												
Percent Not Rated or None Issued	88.7%	89.6%	79.5%	75.7%	52.1%	40.5%	30.5%	32.9%	24.9%	20.5%	26.0%	13.0%
Percent Refused or Don't Know	9.8%	8.0%	10.9%	17.0%	20.5%	21.0%	23.4%	4.4%	22.0%	1.9%	0.0%	13.4%
Ratings of Those with Bonds Moody/Standard & Poor												
Aaa/AAA	-	-	-	-	-	7.7%[3]	30.8%	8.5%[3]	5.5%[3]	18.4%	14.2%	-
Aa/AA	-	-	-	-	-	19.3	53.4	29.9	63.6	46.9	50.6	-
A/A	-	-	-	-	-	31.0	6.0	46.6	21.7	26.6	35.2	-
Baa/BBB	-	-	-	-	-	34.4	6.8	15.0	9.2	8.1	0.0	-
Ba/BB	-	-	-	-	-	3.8	3.0	0.0	0.0	0.0	0.0	-
B/B	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-
Caa/CCC	-	-	-	-	-	3.8	0.0	0.0	0.0	0.0	0.0	-
Total	-	-	-	-	-	100%	100%	100%	100%	100%	100%	-
PUBLIC												
Percent Not Rated or None Issued	77.1%	80.0%	70.0%	72.0%	50.0%	36.0%	26.0%	22.0%	18.0%	18.0%	25.0%	7.1%
Percent Refused or Don't Know	14.3%	8.0%	20.0%	18.0%	24.0%	20.0%	20.0%	2.0%	22.0%	0.0%	0.0%	14.3%
Ratings of Those with Bonds Moody/Standard & Poor												
Aaa/AAA	66.7%	0.0%	100.0%	20.0%	38.4%	9.1%	33.3%	10.5%	6.7%	17.1%	20.0%	18.2%
Aa/AA	33.3	100.0	0.0	40.0	15.4	22.7	51.9	36.8	66.7	53.6	46.7	45.4
A/A	0.0	0.0	0.0	40.0	15.4	36.5	7.4	36.2	26.6	22.0	33.3	27.4
Baa/BBB	0.0	0.0	0.0	0.0	30.8	22.7	3.7	18.5	0.0	7.3	0.0	9.0
Ba/BB	0.0	0.0	0.0	0.0	0.0	4.5	3.7	0.0	0.0	0.0	0.0	0.0
B/B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Caa/CCC	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(Obs.)	(3)	(2)	(1)	(5)	(13)	(22)	(27)	(38)	(30)	(41)	(15)	(11)
PRIVATE												
Percent Not Rated or None Issued	91.2%	92.0%	86.0%	84.0%	70.0%	66.0%	50.0%	80.0%	55.6%	57.7%	28.6%	100.0%
Percent Refused or Don't Know	8.8%	8.0%	14.0%	16.0%	30.0%	32.0%	37.5%	15.0%	22.2%	11.5%	0.0%	0.0%
Rating of Those with Bonds Moody/Standard & Poor												
Aaa/AAA	-	-	-	-	-	0.0%	20.0%	0.0%	0.0%	25.0%	0.0%	-
Aa/AA	-	-	-	-	-	0.0	60.0	0.0	50.0	12.5	60.0	-
A/A	-	-	-	-	-	0.0	0.0	100.0	0.0	50.0	40.0	-
Baa/BBB	-	-	-	-	-	100.0	20.0	0.0	50.0	12.5	0.0	-
Ba/BB	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-
B/B	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-
Caa/CCC	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-
Total	-	-	-	-	-	100%	100%	100%	100%	100%	100%	-
(Obs.)	(0)	(0)	(0)	(0)	(0)	(1)	(5)	(1)	(2)	(8)	(5)	(0)

[1]In the two smallest size categories, these figures do not include ancillary systems which account for 54.8 percent and 31.4 percent, respectively, of these sizes.
[2]All system totals cannot be calculated since there were no observations among private systems.
[3]Small number of observations used to generalize to total population.

V.4 ANCILLARY SYSTEM ASSETS AND LIABILITIES

ANCILLARY SYSTEM BALANCE SHEET DATA

THE VARIATION IN THE PRIMARY BUSINESSES OF ANCILLARY SYSTEMS YIELDS LARGE STANDARD DEVIATIONS IN STATISTICS RELATING TO BALANCE SHEET ITEMS. AS EXPECTED, HOWEVER, THESE FIGURES SHOW THAT BUSINESS ENTITIES OF CONSIDERABLE SIZE BACK UP ANCILLARY SYSTEMS. THE DATA ALSO SHOW THE RELATIVE IMPORTANCE OF WATER UTILITY PLANT AND EQUIPMENT IN THE OVERALL ASSET BASE OF THE ENTIRE BUSINESS.

	POPULATION CATEGORY	
	25-100	101-500
Total Gross Assets[1] of Primary Business ($000)		
Mean	$1,312.3	$ 3,000.4
Median	115.9	479.0
S.D.	$3,721.7	$10,708.9
Range	(10.0-15,000.0)	(19.1-52,000.0)
(Obs.)	(24)	(23)
Total Net Assets[2] of Primary Business ($000)		
Mean	$ 852.0	$ 2,730.9
Median	100.0	400.0
S.D.	$2,443.2	$ 9,251.7
Range	(5.0-10,500.0)	(19.1-43,000.0)
(Obs.)	(26)	(21)
Portion of Gross Assets[1] Related to Water System		
Mean	11.1%	19.7%
Median	6.0	11.0
S.D.	10.5%	22.0%
(Obs.)	(25)	(18)
Long Term Debt[3] ($000)		
Mean	$ 39.2	$ 1,295.5
Median	3.0	15.0
S.D.	$ 61.7	$ 5,542.6
Range	(0-218.2)	(0-30,000.0)
(Obs.)	(26)	(29)

[1]Total Gross Assets includes Plant and Equipment at original cost plus Current Assets.
[2]Total Net Assets is Total Gross Assets minus Accumulated Depreciation.
[3]Long Term Debt is defined as debt with more than one year to maturity.

VI. NATIVE AMERICAN SYSTEMS

NATIVE AMERICAN SYSTEMS

A SAMPLE OF 50 NATIVE AMERICAN SYSTEMS WAS SELECTED FOR STUDY. THE DATA SHOW THAT MOST NATIVE AMERICAN-OWNED SYSTEMS SERVE SMALL POPULATIONS AND RELY SOLELY ON GROUNDWATER.

Population Served	
Mean	789.8
Median	246.5
SD	1,594.3
(Obs.)	(50)

Number of Connections	
Mean	178.8
Median	63.5
SD	377.1
(Obs.)	(48)

Water Source	
100% ground	83.7%
100% surface	14.0
100% purchased	2.3
	100.0%

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NATIVE AMERICAN SYSTEM PRODUCTION AND DELIVERIES

PRODUCTION AND DELIVERIES ARE IN LINE WITH THE RESULTS OF SIMILARLY SIZED PUBLIC AND PRIVATELY OWNED SYSTEMS (THOSE SERVING 501-1,000).

Average Daily Production (MGD)	
Mean	0.09
Median	0.03
S.D.	0.2
(Obs.)	(29)

Daily Production per Capita (gallons)	
Mean	152.2
Median	90.9
S.D.	173.4
(Obs.)	(29)

Annual Deliveries per Connection (gallons)	
Mean	141,800
Median	88,300
S.D.	137,200
(Obs.)	(22)

NATIVE AMERICAN SYSTEM TREATMENT PROFILE

MOST SYSTEMS DO NOT TREAT THEIR WATER. THOSE SYSTEMS THAT DO HAVE TREATMENT TEND TO HAVE DISINFECTION AND FLUORIDE ADDITION, WITH DIRECT FILTRATION BEING THE NEXT MOST COMMON TREATMENT.

Systems Having No Treatment	52%
Occurrence of Treatments in Systems Which Treat:	
Disinfection	
Liquid/Gas Chlorination	54.2%
Hypochlorite	29.2
Total Disinfection	83.4%
Fluoride Addition	58.3
Direct Filtration	16.7%

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NATIVE AMERICAN SYSTEM REVENUES, EXPENSES, AND SURPLUS/DEFICIT

LIKE SMALL SYSTEMS IN GENERAL, NATIVE AMERICAN SYSTEMS TEND NOT TO KNOW DETAILED FINANCIAL DATA AND THE STANDARD DEVIATIONS OF THE DATA ARE LARGE RELATIVE TO THE MEAN. FOR THOSE ABLE TO ANSWER THE QUESTIONS, THE DATA SHOW LOWER REVENUES PER THOUSAND GALLONS OF PRODUCTION THAN FOR SIMILARLY SIZED PUBLIC AND PRIVATELY OWNED SYSTEMS. THEIR EXPENSES, HOWEVER, ARE SLIGHTLY HIGHER.

Revenue Rates (¢/1,000 gallons produced)

Residential[1]

Mean	119.4¢
Median	108.7
S.D.	92.9¢
(Obs.)	(10)

Average for All Customers[2]

Mean	109.3¢
Median	111.1
S.D.	87.9¢
(Obs.)	(12)

[1]Residential Revenues divided by Residential Deliveries.
[2]Total Revenues divided by Total Deliveries.

Operating Expenses[1] (¢/1,000 gallons produced)

Mean	128.7¢
Median	113.4
S.D.	109.5¢
(Obs.)	(14)

[1]Includes Operating and Maintenance Expenses, Depreciation Expense, Other Operating Expenses, and Payments in Lieu of Tax.

THE IMPLICATION OF LOWER SURPLUS/DEFICIT PER THOUSAND GALLONS ALSO APPEARS TO HOLD, WITH THESE SYSTEMS OFTEN SHOWING LARGE DEFICITS.

Surplus/Deficit[1] (¢/1,000 gallons produced)

Mean	-99.2¢
Median	0.0
S.D.	245.9¢
(Obs.)	(14)

[1]Revenues minus Operating Expenses minus Interest.

NATIVE AMERICAN SYSTEM ASSETS AND LIABILITIES

TOTAL NET ASSETS AND NET ASSETS PER UNIT OF PRODUCTION ARE SIMILAR TO OTHER SMALL SYSTEMS, BUT ASSETS PER CONNECTION IS MUCH HIGHER.

Net Assets[1] ($000)	
Mean	$314.7
Median	63.3
S.D.	$346.2
(Obs.)	(10)

Net Assets[1]/Production ($/gallon)	
Mean	$14.6
Median	9.8
S.D.	$15.3
(Obs.)	(8)

Net Assets[1] per Connection ($/connection)	
Mean	$4,967.2
Median	3,966.2
S.D.	$5,463.7
(Obs.)	(8)

DEBT IS MUCH LESS COMMON AMONG NATIVE AMERICAN SYSTEMS THAN SIMILARLY SIZED PUBLIC AND PRIVATELY-OWNED SYSTEMS.

Occurrence of Long Term Debt[2]	
Portion with Long Term Debt	4.8%
(Obs.)	(21)

[1]Net Assets include Current Assets, Net Plant and Equipment, and Other Assets.
[2]Long Term Debt is defined as debt with more than one year to maturity.

NATIVE AMERICAN SYSTEM FINANCING OF CAPITAL EXPENDITURES FOR WATER QUALITY IMPROVEMENT

OVER 40 PERCENT OF THE NATIVE-AMERICAN-OWNED SYSTEMS HAVE PURCHASED TREATMENT EQUIPMENT SINCE 1975. ONE-HALF OF THE SYSTEMS PURCHASES WERE FOR CHLORINATION EQUIPMENT AND ONE-THIRD WERE FOR FILTRATION EQUIPMENT. THE FINANCING VARIED, WITH MOST ANSWERS FALLING INTO THE "OTHER" CATEGORY (THESE FINANCING ARRANGEMENTS WERE LARGELY FARMERS HOME ADMINISTRATION, OR OTHER FEDERAL GRANTS OR LOANS).

Financing Method	
Bank Loan	11.8%
Payment from Capital Reserve	11.8
Other	76.4%
(Obs.)	(13)

AS WAS EXPECTED, THESE SYSTEMS DO NOT HAVE BONDS.

Bond Rating	
Not Rated	92%
Refused/Don't Know	8%
(Obs.)	(50)

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VII. TRENDS

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DISTRIBUTION OF SYSTEMS BY OWNERSHIP--TRENDS

THERE HAVE NOT BEEN SIGNIFICANT SHIFTS IN OWNERSHIP FROM PUBLIC TO PRIVATE OVER THE PAST FIVE YEARS.

1980

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Percentage Ownership												
Public	8.0%	41.0%	81.0%	86.0%	89.7%	85.0%	81.2%	81.2%	81.6%	83.7%	70.9%	93.7%
Private	37.2	27.6	19.0	14.0	10.3	15.0	18.8	18.8	18.4	16.3	29.1	6.3
Ancillary	54.8%	31.4%	-	-	-	-	-	-	-	-	-	-

1975

	POPULATION CATEGORY								
	25-99	100-499	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000-99,999	100,000-999,999	OVER 1,000,000
Percentage Ownership									
Public	8.3%	41.7%	81.1%	86.2%	85.7%	92.9%	82.4%	84.4%	90.9%
Private[1]	91.7	58.3	18.9	13.8	14.3	7.1	17.6	15.6	9.1

[1]Includes "Ancillary" systems.

AVERAGE POPULATION SERVED--TRENDS

AVERAGE POPULATION SERVED IS GENERALLY THE SAME IN ALL SIZE CATEGORIES.

1980

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Population Served												
Mean	57	244	782	1,819	5,765	16,935	37,157	62,830	88,035	209,950	706,830	2,342,736

1975

	POPULATION CATEGORY								
	25-99	100-499	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000-99,999	100,000-999,999	OVER 1,000,000
Population Served									
Mean	56	241	693	1,577	3,477	6,310	30,212	253,828	2,306,000

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DISTRIBUTION OF SYSTEMS BY WATER SOURCE--TRENDS

THE USE OF SURFACE WATER AS A PRIMARY SOURCE HAS APPARENTLY INCREASED IN THE SMALLEST SIZE CATEGORY. IN ADDITION, A LESSER PERCENTAGE OF SYSTEMS IN THE SMALLER SIZE CATEGORIES (THOSE SERVING MORE THAN 101 PEOPLE) USED PURCHASED WATER IN 1980 THAN IN 1975. IN LINE WITH THESE TRENDS, THERE HAS BEEN AN INCREASE IN THE USE OF GROUND WATER AMONG THESE SMALLER SIZES AND A DECREASE AMONG LARGER SIZES.

1980

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Primary Source (percentage of systems)												
Surface	3%	5%	8%	17%	26%	32%	34%	51%	39%	55%	70%	86%
Ground	94	87	90	69	63	54	47	23	27	32	19	7
Other (obs)	4%	8%	2%	14%	11%	14%	19%	26%	34%	13%	11%	7%

1975

	POPULATION CATEGORY								
	25-99	100-499	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000-99,999	100,000-999,999	OVER 1,000,000
Primary Source (percentage of systems)									
Surface	1%	5%	18%	17%	27%	26%	31%	59%	91%
Ground	93	80	69	68	57	64	52	28	9
Purchased	6%	15%	13%	15%	16%	10%	18%	13%	0%

AVERAGE DAILY PRODUCTION--TRENDS

AVERAGE DAILY PRODUCTION WAS CONSISTENTLY HIGHER IN 1980 THAN IN 1975 ACROSS ALL SIZE CATEGORIES.

1980

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Daily Production (MGD)												
Mean	.013	.037	.093	.280	.952	2.753	6.065	11.680	15.912	36.806	129.421	517.491

1975

	POPULATION CATEGORY								
	25-99	100-499	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000-99,999	100,000-999,999	OVER 1,000,000
Daily Production (MGD)									
Mean	.006	.025	.075	.200	.480	.921	5.049	48.003	496.660

DAILY PRODUCTION PER CAPITA--TRENDS

DAILY PRODUCTION PER CAPITA WAS SIGNIFICANTLY HIGHER FOR SMALL AND MEDIUM SIZE CATEGORY SYSTEMS IN 1980 COMPARED TO 1975. ONLY IN THE LARGEST SIZE CATEGORY WAS PRODUCTION PER CAPITA SMALLER IN 1980. THE RANGE OF RESPONSE WAS SOMEWHAT LARGER IN 1980 THAN THAT ALLOWED IN 1975; HOWEVER, CLOSE EXAMINATION INDICATED THAT THE LARGER RANGES DID NOT AFFECT THE MEANS SIGNIFICANTLY.

1980

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Daily Production Per Capita (gallons)												
Mean	135	150	123	139	172	179	163	179	181	187	182	183
Range	(12-386)	(20-752)	(13-775)	(15-788)	(22-604)	(33-534)	(22-445)	(57-940)	(89-318)	(81-449)	(97-304)	(112-236)

1975

	POPULATION CATEGORY								
	25-99	100-499	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000-99,999	100,000-999,999	OVER 1,000,000
Daily Production Per Capita (gallons)									
Mean	98	98	109	128	138	142	160	183	214
Range	(11-365)	(10-469)	(16-511)	(11-533)	(24-317)	(23-358)	(25-516)	(13-591)	(118-593)

RESIDENTIAL DELIVERIES PER CAPITA--TRENDS

(gallons per capita per day)

DESPITE THE HIGHER PRODUCTION PER CAPITA SHOWN ON THE PREVIOUS TABLE, RESIDENTIAL DELIVERIES PER CAPITA HAVE GENERALLY DECLINED SINCE 1975.

1980

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Residential Deliveries Per Capita												
Mean	95	91	74	75	84	82	80	86	87	85	87	59

1975

	POPULATION CATEGORY								
	25-99	100-499	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000-99,999	100,000-999,999	OVER 1,000,000
Residential Deliveries Per Capita									
Mean	109	108	104	94	79	89	104	79	72

TREATMENT PROFILE--TRENDS

OF THOSE SYSTEMS THAT PROVIDE ADDITIONAL TREATMENT TO THEIR WATER, THERE HAS BEEN AN INCREASE SINCE 1975 IN THE PERCENTAGE OF SYSTEMS THAT DISINFECT. THE USE OF OTHER TREATMENTS SUCH AS CORROSION CONTROL AND AERATION HAS NOT EXPERIENCED THE SAME GROWTH.

1980

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Disinfection	41%	45%	66%	65%	80%	86%	84%	86%	78%	100%	97%	93%
Corrosion Control	0	7	6	6	20	30	39	42	35	45	74	71
Aeration	2%	8%	4%	7%	14%	14%	15%	23%	15%	13%	25%	0%

1975

	POPULATION CATEGORY								
	25-99	100-499	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000-99,999	100,000-999,999	OVER 1,000,000
Disinfection	30%	40%	56%	61%	79%	71%	79%	92%	100%
Corrosion Control	2	3	12	13	29	41	36	68	91
Aeration	2%	2%	15%	11%	15%	17%	14%	25%	9%

REVENUES PER 1000 GALLONS DELIVERED--TRENDS

THERE HAS BEEN A SUBSTANTIAL INCREASE IN REVENUES (MEASURED IN CENTS PER 1000 GALLONS DELIVERED) ACROSS ALL SIZE CATEGORIES SINCE 1975. THE AMOUNT OF GROWTH WAS LARGEST IN THE SMALL SIZE CATEGORIES.

1980

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Mean Revenues[1]												
Residential	200.4¢	172.1¢	168.0¢	157.7¢	128.0¢	104.6¢	116.8¢	107.5¢	91.8¢	102.4¢	83.4¢	63.8¢
Average for All Sales	190.4	171.5	150.0	122.4	106.2	85.7	94.2	82.1	76.5	77.5	73.0	55.9

1975

	POPULATION CATEGORY								
	25-99	100-499	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000-99,999	100,000-999,999	OVER 1,000,000
Mean Revenues[2]									
Residential	67.2¢	95.4¢	89.9¢	68.9¢	86.8¢	66.8¢	62.3¢	63.1¢	44.9¢
Average for All Sales	73.2	89.0	80.3	72.0	73.1	63.5	55.1	47.3	28.3

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[1] 1980 data for mean revenues excludes ancillary systems and systems that do not charge for water.
[2] 1975 data appears to include ancillary systems and systems that do not charge for water in the calculation of mean revenues.

TOTAL OPERATING EXPENSES--TRENDS

(¢/1000 gallons produced)

OPERATING EXPENSES PER 1000 GALLONS OF PRODUCTION HAVE ALSO INCREASED SIGNIFICANTLY IN ALL SIZE CATEGORIES SINCE 1975.

1980

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Operating Expenses												
Mean	194.8¢	175.6¢	133.5¢	109.1¢	89.1¢	64.0¢	67.5¢	63.3¢	59.5¢	50.2¢	44.7¢	30.8¢
S.D.	156.7	188.4	167.3	92.9	63.2	32.5	39.3	29.6	21.3	19.6	16.8	18.2

1975

	POPULATION CATEGORY								
	25-99	100-499	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000-99,999	100,000-999,999	OVER 1,000,000
Operating Expenses									
Mean	77.8¢	64.8¢	75.8¢	62.4¢	57.5¢	52.6¢	39.9¢	31.9¢	23.5¢
S.D.	72.1	58.2	56.5	47.3	41.2	39.3	24.1	19.4	9.9

GROSS ASSETS/AVERAGE DAILY PRODUCTION--TRENDS

($/gallon)

A SLIGHTLY LARGER AMOUNT OF GROSS ASSETS WAS USED TO SUPPORT DAILY PRODUCTION IN 1980 THAN IN 1975.

1980

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Gross Assets/Production[1]												
Mean	$5.5	$9.0	$4.0	$4.0	$3.2	$1.9	$2.5	$2.0	$1.5	$1.6	$1.4	$1.4

1975

	POPULATION CATEGORY								
	25-99	100-499	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000-99,999	100,000-999,999	OVER 1,000,000
Gross Assets/Production[1]									
Mean	$4.9	$5.9	$2.9	$2.9	$4.2	$2.7	$1.7	$1.3	$1.0

[1]Gross Assets is defined as Gross Plant and Equipment (Production-Treatment, Distribution, Other) before depreciation.

VIII. METHODOLOGY

METHODOLOGY

The primary objective of the survey was to provide an updated description of the water utility industry. To accomplish this, the study comprised four major phases:

- Design of survey form
- Sample selection
- Conduct of the survey
- Data analysis

Each of these is discussed in the following sections.

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DESIGN OF SURVEY FORM

The survey questionnaire was based on the 1975 questionnaire with specific improvements developed on the basis of the earlier experience and on suggestions from EPA's Office of Drinking Water. The major change was to include a third ownership type (ancillary) for the financial information. This was prompted by the recognition that systems such as these are extremely important in the smallest size categories (accounting for 54.8 percent and 31.4 percent, respectively, in the two smallest size categories) and that the financial information concerning water operations available to them is very limited. Thus survey forms with financial questions tailored to the ancillary, public and privately owned systems was developed. Operating questions were the same for all systems.

As a result three forms were used.

- Public
- Private
- Ancillary

Each is included in this appendix.

Other changes to the questionnaire included the rewording of some questions, deletion of some questions, and the inclusion of new areas of information (e.g., operators, rates).

Questionnaires were then reviewed by individuals within EPA and various trade organizations (American Water Works Association, National Association of Water Companies, Conference of State Sanitary Engineers, Manufactured Housing Association). A pre-test of the survey with nine water systems was also conducted. Numerous changes were made based on comments received and the pretest.

The form and supporting justification were then submitted to the Office of Management and Budget (OMB). OMB approval (OMB No. 2000-0389) was received in December 1981.

SAMPLE SELECTION

The population from which the survey sample was drawn is the Federal Reporting Data System (FRDS) inventory of community water systems, a listing of systems and some simple identifying characteristics. This inventory is aggregated annually from information submitted by the states and covers approximately 59,000 systems. It is the only source of statistics on the number and size distributions of community water systems operating nationwide and is considered by the Office of Drinking Water to be comprehensive.

The sample consisted of 27 separate analytical cells distinguished first by size of customer base and then by ownership type. There were 12 size categories in all ranging from 25-100 to over 1 million people served. The larger size categories were segmented into two ownership types: public and private. The smaller size categories are segmented into three ownership types: public, private, and ancillary private. The ancillary ownership type was used in these sizes because of the high proportion of smaller water systems in which water service is not the primary business of the entity (such as mobile home parks or hospitals) and because it is not possible to compare their financial characteristics with systems whose primary business is water service. Finally, a 27th cell consisting of Native American systems was selected.

Each of the characteristics used to distinguish the 26 individual cells (excluding the Native American cell) was necessary for accurate representation of the sample along the dimensions most critical to regulatory impact analysis. Development of data valid by size of water systems allows examination of the differential impact of regulations on an industry in which physical plant, management skills, and technical skills vary greatly with the size of the utility. The ownership characteristics directly affect the financial structure of the utility and thus the way in which regulatory initiatives affecting capital expenditures or operating expenses impact a water utility and are passed on to customers or borne by the utility.

Within each of the 26 size/ownership groupings, a random sample of either 50 systems (plus alternates), or the total population if less than 50, was drawn. For the Native American cell, a random sample of 50 systems (plus alternates) was chosen from several EPA regions. The standard cell size of 50 was selected

following consultation with professional survey statisticians as an appropriate balance between a larger size to achieve greater statistical validity and a smaller size to minimize the cost of conducting the survey.

The goal of 50 systems or the entire population was reached in all but the smallest size category and some of the largest size categories. Despite repeated efforts to reach the smallest size systems and the use of over 100 alternates in each of these cells, only 35 public and 34 privately-owned systems are included in the sample. The entire population could not be reached in the largest size categories generally due to such problems as refusals or unwillingness by a parent company to complete surveys for each subsidiary. The resulting sample sizes and the corresponding number of systems listed in the FRDS inventory are shown below.

SURVEY SAMPLE

	POPULATION CATEGORY												
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000	Total
Public	35	50	50	50	50	50	50	50	50	50	20	14	519
Private	34	50	50	50	50	50	40	20	9	26	7	1	387
Ancillary	50	50	-	-	-	-	-	-	-	-	-	-	100
Total	119	150	100	100	100	100	90	70	59	76	27	15	1,006
Plus 50 Native Americans													1,056

NATIONAL FLEALS -- FRDS INVENTORY

	POPULATION CATEGORY												
	25-100[1]	101-500[1]	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100 001-500,000	500,001-1,000,000	OVER 1,000,000	Total
Public	1,654	7,278	5,015	6,529	3,454	1,057	944	182	82	195	20	14	26,424
Private	7,693	4,898	1,176	1,063	397	186	219	42	19	38	8	1	15,740
Ancillary	11,333	5,574	-	-	-	-	-	-	-	-	-	-	16,907
Total	20,680	17,750	6,191	7,592	3,851	1,243	1,163	224	101	233	28	15	59,071
Plus 807 Native Americans													59,878

[1]Since the FRDS inventory does not differentiate between ancillary and other private systems, random samples of 75 systems within each of the two smallest size categories were drawn and analyzed to determine the relative proportion of these two ownership types.

CONDUCT OF THE SURVEY

The administration of the questionnaire actually occurred in three steps:

- Initial phone contacts
- Mail-out of survey
- Phone interviews

The systems were initially contacted by phone, at which time the survey was described, basic information concerning system size and ownership was confirmed, the system's agreement to participate was obtained, and a time for a call-back to obtain the information was agreed upon. The appropriate survey was then mailed to the respondent. Finally, at the agreed upon time the respondent was telephoned and the questionnaire information was filled out by trained interviewers. In practice, successful contact with the respondent and completion of the survey generally required several telephone calls by the interviewer. Many of the ancillary and small private systems could only be reached on weekends or on specific days in the week.

The use of telephone interviews both improved the quality of information (questions could be clarified) and improved the response rate (refusals either before or after receipt of the form totalled 15 percent).

Key responses were then checked for reasonableness. Where necessary, respondents were called back to clarify or correct responses. Such call-backs were required for over half of the respondents.

DATA ANALYSIS

Further data clean-up served as the first step in the analysis of results. Computerized checks on key items (e.g., the sum of revenue, expense, asset and liability figures, and reported deliveries less than reported production) led to further call-backs and the modification of selected answers. Table formats which cover all questions asked on the survey were then developed, reviewed, and finalized.

The calculation of the ratios and means, medians, and standard deviations was then carried out. High and low extreme values on each data item were investigated and corrected. Additionally, these investigations led to broader exclusions for certain items such as the exclusion of wholesalers, schools and prisons from the calculation of average number of total connections. Where these broader exclusions are made, they are referenced in the footnotes of the tables.

Even with these measures, the data show large standard deviations due to valid characteristics of the underlying population. The presentation of standard deviations and medians rather than just means on most items is an acknowledgement of this characteristic and serves to provide the reader with more useful results.

In most cases, the data are reported for each size/ownership cell and then generalized to a total for each size category. Size category totals are calculated by weighting the results for each size/ownership cell according to its underlying frequency in the population universe of that size category. These underlying frequencies are reported in the Sample Selection section. The actual weights used to calculate size category totals are as follows:

OWNERSHIP SAMPLE WEIGHTS

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Percentage Ownership												
Public	8.0%	41.0%	81.0%	86.0%	89.7%	85.0%	81.2%	81.2%	81.6%	83.7%	70.9%	93.7%
Private	37.2	27.6	19.0	14.0	10.3	15.0	18.8	18.8	18.4	16.3	29.1	6.3
Ancillary	54.8%	31.4%	-	-	-	-	-	-	-	-	-	-

In a selected number of tables, particularly those relating to operating characteristics, the data is also reported according to size and water source type. The following three water source categories are commonly used for analysis: predominantly surface water, predominantly ground water, and other (includes predominantly purchased or mixed). Size category totals are calculated in these tables by weighting the results for each size/water source cell according to its underlying frequency in the population. Because there is no other valid source for this information (FRDS uses different water source definitions) the underlying frequencies are assumed to be the same as those found in the survey sample. The weights used are as follows:

WATER SOURCE WEIGHTS

	POPULATION CATEGORY											
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	10,001-25,000	25,001-50,000	50,001-75,000	75,001-100,000	100,001-500,000	500,001-1,000,000	OVER 1,000,000
Water Source												
Predominantly Surface Water	3.0%	5.0%	7.5%	16.0%	26.0%	32.3%	36.5%	50.0%	39.0%	55.0%	70.0%	85.0%
Predominantly Ground Water	93.5	86.7	89.0	69.3	63.1	53.0	46.9	29.5	27.0	32.0	19.0	7.2
Other	3.5%	8.3%	2.5	16.3	10.5	16.3	18.6	26.1	36.0	13.0	10.6	7.2

Wherever there is any ambiguity concerning the variable used to calculate totals (i.e., ownership or water source), an explanatory footnote appears in the table.

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APPENDIX

PUBLIC SYSTEM QUESTIONNAIRE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
WATER

Dear Participant,

The U.S. Environmental Protection Agency (EPA) is asking your help in conducting a nationwide survey of the water utility industry to get the most current information on operating and financial characteristics. Because you supply water to twenty-five or more people, you are considered a public water system under the Safe Drinking Water Act. That's why we are writing to you.

To continue protecting the public health, we at EPA need to take into account the special needs of operations that are not traditional water plants. We would like you to participate in this survey by answering the enclosed questionnaire during a telephone interview. Your response is very important to us. We conduct these surveys only infrequently and then contact less than two percent of all systems, so you can see that you contribution will play a significant role.

We have worked with representatives of the American Water Works Association, the National Association of Water Companies, the National Manufactured Housing Federation and other organizations, utilities and state health departments to develop and review the questionnaire. Their endorsements are included with this package. In addition, we have field tested it to identify and eliminate problem areas, and are using a telephone interview technique so that you can ask questions if you are not sure of the type of information we are collecting.

EPA has contracted with an independent consulting and research firm, Temple, Barker and Sloane, Inc. (TBS), to administer this survey to a representative sample of water utility systems of all sizes, both public and private. Please look at the enclosed questionnaire so that you will be familiar with the requested information. It is not necessary to return the forms. TBS will take your answers during the telephone interview, and I recommend that you jot down any information that you may not be able to provide readily during the telephone call. TBS will contact you within the next two weeks to conduct the interview.

I appreciate your cooperation in this survey which will help us to understand the industry more completely.

Sincerely,

Victor J. Kimm
Office Director
Office of Drinking Water (WH-550)

National Association of
WATER
COMPANIES
(A District of Columbia Non-Profit Corporation)

EXECUTIVE DIRECTOR
Frederick N. Allen

SUITE 1110, 1019 19TH STREET, N.W.
WASHINGTON, D.C. 20036 • 202-638-3461

Dear Water Utility Manager,

The Environmental Protection Agency is conducting a survey and the questionnaire you are receiving herewith is necessary for informational data on the water utility industry. The Agency has requested our endorsement of this survey and by this letter we are urging you to cooperate.

Investor-owned water utilities are an integral part of the water supply industry in this country and no survey would be complete without inclusion of data from this segment of the industry. This information will be helpful in enhancing the regulatory process.

Data on the very small systems, the vast majority of which are privately owned, is very scarce so it is particularly important that these utilities cooperate in this endeavor. With this information it will be considerably easier to work with these systems in helping them overcome any problems they are experiencing with providing safe and adequate water.

Please complete the questionnaire with as much detail as possible in order to make this a successful survey of the water supply industry. Thank you.

Sincerely,

C. Robert Morris

C. Robert Morris
Associate Executive Director

CRM:pjg
Enc.

American Water Works Association | 6666 West Quincy Avenue | Denver, Colo. 80235 | 303 794-7711

Dear Water Utility Manager:

You should have received a telephone call from EPA explaining that this survey questionnaire would be mailed. The Agency has asked for our cooperation, too, and we're giving it gladly.

I know it's a long questionnaire, and it will take more than just a few minutes to look up the information and fill in the blanks. But please do take the time. It's extremely important that the government has complete, accurate information about the work we do and the systems we operate in the water supply field.

Future federal regulations will be written--or not written—based largely on the information our industry provides here. So your personal participation is vitally important.

The American Water Works Association heartily endorses this effort by EPA and urges full cooperation by every utility. Please help. Please fill out the questionnaire as completely as possible and make this survey as successful as possible.

Sincerely,

Kenneth J. Miller

Kenneth J. Miller
President

KJM/ljd
Attachment

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President KENNETH J. MILLER Denver Colorado
President-Elect JOHN H. STACHA Dallas Texas
Vice-President WILLIAM C. LYNCH Catskill New York
Immediate Past President JEROME B. GILBERT Oakland California
Treasurer THOMAS J. BLAIR III Charleston West Virginia
Executive Director DAVID B. PRESTON Denver Colorado

NATIONAL MANUFACTURED HOUSING FEDERATION, INC.
1700 PENNSYLVANIA AVE. N.W., SUITE 745
WASHINGTON, D.C. 20006 (202) 347-1116

MEMORANDUM TO: Manufactured Housing Association Executives

SUBJECT: EPA Survey of Water Systems

The questionnaire you have received is being mailed to manufactured housing community owners/operators by a private consulting firm under the terms of a contract awarded by the Environmental Protection Agency (EPA). The results are to be used by EPA in evaluating the effectiveness of its regulations concerning drinking water, as mandated by the Congress in the Safe Drinking Water Act.

It will be beneficial to our industry if the park members of your association who operate their own water systems will take a few minutes to complete the questionnaire. Your encouragement to insure a cooperative response will be appreciated.

Sincerely,

H. E. Blomgren
President

HEB/lmk

CONFERENCE
of
STATE SANITARY ENGINEERS

November 23, 1981

Please address reply to:
.351 Garden City Drive
Landover, Maryland 20785
(301) 459-7088

Victor J. Kimm
Office of Drinking Water
Waterside Mall, East Tower
4th & M Streets, S.W.
Washington, D. C. 20515

Dear Mr. Kimm:

Members of the Conference of State Sanitary Engineers have reviewed the Office of Drinking Water proposal to collect data to be used in determining impacts of future regulations on the water industry.

CSSZ supports the effort by EPA to minimize unnecessary burden on water utilities, and offers any possible assistance in encouraging industry participation in the proposed survey.

Sincerely,

James D. Clise

James D. Clise, P.E.
Executive Director

JDC:bm

cc: Bill Kelley

OMB No. 2000-0389
Expires 12/31/82

Community Water Systems Survey

Survey No. _____

Section I. GENERAL INFORMATION

1. Which of the following categories best describes the ownership structure of your system?

Public

_____ Owned by local government (municipal, state, district, authority, etc.)

_____ Owned by federal government (military base, prison, etc.)

_____ Indian land

Ancillary

Privately owned and operated as a necessary part of another business

_____ Mobile home park

_____ Hospital

_____ School

_____ Institution

_____ Other (describe) _____

_____

_____

Private

Privately owned and operated primarily as a water business

Owned by

_____ Homeowners' Association or Subdivision

_____ Investors

_____ Other

2. What is the total permanent residential population served directly by your system (excluding transient users and population served directly through wholesales):

_____

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Section I. GENERAL INFORMATION (continued)

3. How much additional residential population, if any, does your system serve on a seasonal basis (that is, population served only 2-3 months during the year)?

_____

NOTE: IF YOUR SYSTEM IS CLASSIFIED AS ANCILLARY, PLEASE ANSWER QUESTIONS 4 AND 5.

4. What percent of your permanent residential population is:

_____ Less than 10 years old?

_____ More than 60 years old?

5. On average, how long are people served by your system (i.e., how long is it before they move out of your service area)? Check one:

_____ Less than 2 years

_____ 2-5 years

_____ Over 5 years

6. Please record the number of active *service connections* you have in *each* of the following service categories:

SERVICE CATEGORY	NUMBER OF ACTIVE SERVICE CONNECTIONS IN EACH CATEGORY
Residential connections	
Commercial/Industrial connections (e.g. stores, factories, etc.)	
Wholesale connections (i.e., customers who redistribute your water to other users)	
Other (e.g., agricultural connections, municipal/institutional connections—town, hospitals, etc.)	
Fire connections	
TOTAL CONNECTIONS	

NOTE: IF YOUR SYSTEM HAS LESS THAN 15 TOTAL ACTIVE SERVICE CONNECTIONS AND LESS THAN 25 PERMANENT RESIDENTS, YOU NEED NOT CONTINUE ANSWERING THE REST OF THE QUESTIONS.

Section II. OPERATING DATA

PRODUCTION AND STORAGE

7. Please indicate the amount of water in gallons your system pumped (i.e., the amount of water to the distribution system) in 1980 from each of the following sources.

	GALLONS PUMPED BY SYSTEM IN 1980
Surface water	
Groundwater	
Purchased water (surface or ground)	
TOTAL WATER PUMPED BY YOUR SYSTEM FROM ALL SOURCES	

8. In 1980, excluding purchased water, what was the maximum number of gallons your system produced in any *one day* (that is, your maximum day production)?

_____ gallons produced in maximum day

9. What is your system's treated water storage capacity?

_____ gallons

DELIVERIES

10. Please indicate the total amount of water you delivered (including purchased water, if any) to each of the following types of customers in 1980. Please include unmetered deliveries, if any, in your estimate.

SERVICE CATEGORY	GALLONS DELIVERED IN 1980
Residential connections	
Commercial/Industrial connections (e.g., stores, factories, etc.)	
Wholesale connections (i.e., customers who redistribute your water to other users)	
Other (e.g., agricultural connections, municipal/institutional connections—towns, hospitals, etc.)	
Fire connections	
TOTAL GALLONS DELIVERED BY YOUR SYSTEM	

11a. What percent of your system's sales go to metered customers?

_____ 0%
_____ 1-50%
_____ 50-80%
_____ 80-100%

NOTE: IF MORE THAN 50 PERCENT OF YOUR SALES ARE TO METERED CUSTOMERS, PLEASE ANSWER THE FOLLOWING QUESTION.

b. Approximately what percent of your 1980 production was lost or unaccounted for in 1980?

_____ %

Section II. OPERATING DATA (continued)

DISTRIBUTION SYSTEM

12. How many miles of distribution system (transmission and distribution mains, not connections or service laterals) does your system have? Please exclude transmission of raw water to treatment plant if possible.

_____ Less than 1 mile
_____ 1 - 5 miles
_____ 5 - 25 miles
_____ 25 - 100 miles
_____ 100 - 500 miles
_____ 500 - 1000 miles
_____ 1000 - 2500 miles
_____ Over 2500 miles

13. Approximately what percent of your distribution system (transmission and distribution mains, not connections) is made up of each of the following types of pipe?

_____% Concrete . . . if it is lined, what is the lining? _____
_____% Asbestos cement . . . if it is lined, what is the lining? _____
_____% Cast or ductile iron . . . if it is lined, what is the lining? _____
_____% Plastic . . . if it is lined, what is the lining? _____
_____% Other . . . specify type _____
_____ Do not know

OPERATORS

14a. How many treatment plant operators does your system have? _____
NOTE: IF THERE ARE NO TREATMENT PLANT OPERATORS, SKIP TO QUESTION 17.

b. How many are full-time? _____

c. How many are part-time? _____

c. Do any of the part-time operators also service other water systems in the area?

_____ Yes
_____ No
_____ Unsure

15. How many of the operators are certified by the state? _____

16. On average how many hours per week does each operator spend at the water treatment plant operation?

_____

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Section II. OPERATING DATA (continued)

REGIONALIZATION

17. Is your system *actively* involved in a physical regionalization (i.e., is it physically hooked up to another system)?

_____ Yes, used for emergency situations only
_____ Yes, used for other than emergency situations
_____ No

18. Is your system *actively* involved in a management regionalization (i.e., do you share billing procedures, or other management services)?

_____ Yes
_____ No

ALTERNATIVE SUPPLIES

19a. If your present source became unusable, is there a nearby surface water supply which could serve as an alternate (i.e., a usable lake or river)?

_____ Yes
_____ No
_____ Do not know

b. If yes, how far away is it?

_____ miles

20. Is there a nearby groundwater supply (that is, a usable aquifer) which could serve as an alternative if your present source became unusable?

_____ Yes
_____ No
_____ Do not know

Section III. WATER SOURCE

21. In total, how many wells or springs does your system generally operate?

_____

NOTE: IF 1 OR NONE, SKIP TO QUESTION 25.

22. Are all the wells in one general location? (That is, are they all within a few hundred feet of one another)?

_____ Yes
_____ No

23. If not, how many groups of wells (i.e., wells that are within a few hundred feet of one another) are there in the system?

_____

Section III. WATER SOURCE (continued)

24a. How far apart are the two closest groups of wells? _____

24b. How far apart are the two farthest groups of wells? _____

Check:	a. Closest	b. Farthest
Up to ½ mile	_____	_____
½ - 2 miles	_____	_____
2 - 5 miles	_____	_____
5 - 10 miles	_____	_____
Unsure	_____	_____

25. In total, from how many surface water sources does the system receive water (count upstream lakes and rivers, not just intakes from reservoirs)?

_____

26. Does your system treat its water?

_____ Yes

_____ No *NOTE: IF NO, SKIP TO QUESTION 32.*

27. If yes, where is the water treated?

_____ Each well or water source

_____ Central treatment locations (how many are there? #_____)

28. What is the capacity of each of the treatment locations (i.e., the amount that could be pumped and treated at each location in a day)?

Treatment Plant #1 _____ gallons/day

Treatment Plant #2 _____ gallons/day

Treatment Plant #3 _____ gallons/day

Treatment Plant #4 _____ gallons/day

Treatment Plant #5 _____ gallons/day

Treatment Plant #6 _____ gallons/day

29. What is the water source of each of the treatment locations?

	Treatment Plant					
	#1	#2	#3	#4	#5	#6
Surface	1. _____	2. _____	3. _____	4. _____	5. _____	6. _____
Ground	1. _____	2. _____	3. _____	4. _____	5. _____	6. _____
Mixed	1. _____	2. _____	3. _____	4. _____	5. _____	6. _____

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Section III. WATER SOURCE (continued)

30. For each treatment location, what forms of treatment are performed?

TREATMENT TYPE	Treatment Plant #1	#2	#3	#4	#5	#6
Disinfection						
Ammonia & Chlorine (chloramines)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Free Chlorine (e.g., liquid chlorine products)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Hypochlorite (e.g., powdered chlorine products)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Other Disinfection	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Conventional Plant (coagulation, sedimentation, filtration)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Direct Filtration	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Fluoride Addition	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Fluoride Removal	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Corrosion Control	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Granular Activated Carbon	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Powdered Activated Carbon	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Aeration	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Lime Soda Softening	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Iron Removal	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Ammoniation	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Reverse Osmosis	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Activated Alumina	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Cation Exchange	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Anion Exchange	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Other (please describe)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____

_____

_____

Section III. WATER SOURCE (continued)

NOTE: IF YOU CHLORINATE AND HAVE FILTRATION, PLEASE ANSWER QUESTIONS 31a - 31d.

31a. Do you prechlorinate (that is, chlorinate before settling and filtration)?

_____ Yes

_____ No

b. Do you chlorinate after filtration?

_____ Yes

_____ No

c. Do you boost chlorine residuals in the distribution system?

_____ Yes

_____ No

d. If yes, is this done on a continuous or periodic basis?

_____ Continuous

_____ Periodic

Section IV. PUBLIC SYSTEM FINANCIAL INFORMATION

NOTE: PLEASE NOTE THAT THE FINANCIAL INFORMATION NEEDED IS APPLICABLE ONLY TO DRINKING WATER SUPPLY OPERATIONS. IF YOUR WATER SYSTEM IS CONSOLIDATED WITH ANOTHER ENTITY (FOR EXAMPLE, MUNICIPAL BUDGET, COMBINED WATER-SEWER OPERATION, ETC.) PLEASE TRY TO PROVIDE YOUR BEST ESTIMATE OF FINANCIAL INFORMATION WHICH IS APPLICABLE TO YOUR WATER SYSTEM ONLY. IN ADDITION, IF YOUR WATER SYSTEM HAS AN ANNUAL REPORT OR OTHER FINANCIAL STATEMENT, IT WOULD BE EXTREMELY HELPFUL IF YOU COULD FORWARD A COPY TO EPA COMMUNITY WATER SYSTEM SURVEY, TEMPLE, BARKER & SLOANE, 33 HAYDEN AVENUE, LEXINGTON, MA 02173.

32a. The following information is based on financial data for: *(NOTE: Please use calendar year 1980 if possible.)*

FROM: Month _____ Year _____

THROUGH: Month _____ Year _____

b. Which of the following categories most closely describes the financial information available for your water system?

_____ Data above are based primarily on financial records applicable to the water operations of this system

_____ Data above are based primarily on estimates

REVENUES

33. Please indicate your total revenues *from water operations* from each of the following service categories.

SERVICE CATEGORY	FROM WATER OPERATIONS
Revenues from residential connections	$ _____
Revenues from commercial/industrial connections	$ _____
Revenues from wholesale connections (i.e., customers who redistribute your water to other users)	$ _____
Other revenues from water sales (e.g., agricultural connections, municipal/institutional connections—towns, hospitals, etc.)	$ _____
Total revenue from water sales	$ _____
Revenues from initiation of connections, i.e., hook-ups	$ _____
TOTAL REVENUES FROM WATER OPERATIONS	$ _____

34a. Does your system have other sources of revenue (e.g., power sales, recreation)?

_____ Yes

_____ No

b. If yes, what is the revenue from those sources?

$_____

35. Please indicate the amount of funds received from the municipal general fund other than for water used by municipality which is counted in revenues (Q33).

$_____

_____ Do not receive funds

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Section IV. PUBLIC SYSTEM FINANCIAL INFORMATION (continued)

36. How is the budget of your water system related to the budget of the municipality?

_____ Part of general municipal budget (for example, part of a general fund)

_____ Enterprise fund (funds segregated and accounted separately)

_____ Independent of municipal budget (for example, an independent agency)

EXPENSES

37. Please indicate the total operating expenses of your water system in 1980, and, to the best of your ability, the division of the total operating expenses among the following categories:

Operating and maintenance (e.g., chemicals, power, salaries) ..... $ _____

Depreciation expense ..... $ _____

Other operating costs (do *not* include interest or principal repayment) ..... $ _____

Payments in lieu of taxes or other cash transfers to general fund ..... $ _____

TOTAL OPERATING EXPENSES ..... $ _____

38. Please indicate 1980 debt service ..... $ _____

Interest expense ..... $ _____

Repayment of principal ..... $ _____

39. What was the surplus/deficit of your system in 1980? (Should equal Revenues - Expenses - Interest) ..... $ _____

WATER RATES

40a. How do you charge for water service (check one)?

_____ Flat fee . . . How much is it? $_____

_____ Flat rate per thousand gallons . . . How much is it? $_____ per 1000 gallons

_____ Charges based on non-water use measure (e.g., frontage feet, size of service connection, lot size) . . . How much is it? $_____ per _____

_____ Combination (e.g., flat fee with rates based on usage above a certain amount) . . . How much is it? _____

_____ Declining block rate per thousand gallons (meter) . . . See Question 40b.

_____ Increasing block rate per thousand gallons (meter) . . . See Question 40b.

_____ Other . . . Please explain rate structure and amount. _____

_____

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SECTION IV. PUBLIC SYSTEM FINANCIAL INFORMATION (continued)

NOTE: PLEASE ANSWER QUESTION 40b IF YOU CHARGE DECLINING OR INCREASING BLOCK RATES.

40b. What are the prices per unit of water usage and how do these change as the volume of water usage increases? Please note the prices, units, and block sizes for residential, commercial, and wholesale customers.

Residential		Commercial/Industrial		Wholesale	
Price/Unit (e.g., $/1,000 gal)	Block or Unit (e.g., 5,000 gal)	Price/Unit (e.g., $/1,000 gal)	Block or Unit (e.g., 5,000 gal)	Price/Unit (e.g., $/1,000 gal)	Block or Unit (e.g., 5,000 gal)
$____/____	gals for the first ____ gals	$____/____	gals for the first ____ gals	$____/____	gals for the first ____ gals
$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals
$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals
$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals

41. What is your minimum residential charge and how much water is included in the minimum charge?

$_____ for _____ gallons

or

$_____ for _____ cubic feet

_____ No minimum charge

42. What is the average annual water use per residential customer (family) in your system?

_____ gallons

43. Is your water system required by law to obtain approval from a state regulatory agency or authority prior to changing its rates?

_____ Yes

_____ No

_____ Unsure

FINANCING OF EXPENDITURES

44. Since 1975, have you made any major expenditures (e.g., purchase of equipment, major modifications, or major overhauls) to improve water quality (i.e., not simply to increase capacity)?

_____ Yes

_____ No

45. If yes, what did you do? Type of equipment purchased:

Chlorinator _____

Other disinfection _____

Filtration equipment _____

Other (please explain) _____

_____

Section IV. PUBLIC SYSTEM FINANCIAL INFORMATION (continued)

46. What was the nature of the improvement in water quality?

Coliform _____
Turbidity _____
Barium _____
Arsenic _____
Silver _____
Nitrates _____
Fluoride _____
Cadmium _____
Chromium _____
Lead _____
Mercury _____

Other (please explain) _____

_____

_____

47. What prompted the improvements?

_____ Response to a regulation
_____ Upgrade/replacement of equipment
_____ Other (please explain) . . . _____

48. How was the improvement financed?

_____ Revenue Bond
_____ General Obligation Bond
_____ Bank Loan
_____ Payment from capital reserve fund
_____ Special Assessment
_____ Other (please explain) _____

_____

Section IV. PUBLIC SYSTEM FINANCIAL INFORMATION (continued)

49. If your bonds are rated by a rating service, what is their current rating and what service rated them?

_____ Not Rated or No Bonds Issued

Moody's	Aaa	_____	B	_____
	Aa	_____	Caa	_____
	A	_____	Ca	_____
	Baa	_____	C	_____
	Ba	_____	D	_____
Standard & Poors	AAA	_____	B	_____
	AA	_____	CCC	_____
	A	_____	CC	_____
	BBB	_____	C	_____
	BB	_____	D	_____

50. Please indicate to the best of your ability, the division of the total assets of your water system among the following categories:

CATEGORIES OF ASSETS

Current Assets (cash, accounts receivable, prepaid expenses) ..... $ _____

Plant and equipment valued at original cost

Production-treatment plant(s) ..... $ _____

Distribution system ..... $ _____

All other plant and equipment ..... $ _____

TOTAL plant and equipment ..... $ _____

Less accumulated depreciation or sinking fund for replacement (if any) ..... $ _____

TOTAL net plant and equipment ..... $ _____

Other Assets not included in above categories (please explain) ..... $ _____

_____

TOTAL ASSETS OF WATER SYSTEM ..... $ _____

51. Please summarize the liability, capital, and other balance sheet categories listed below.

Current liabilities (accounts payable, accrued expenses, etc.) ..... $ _____

Long-term debt (over 1 year to maturity) ..... $ _____

Other capital items (annexation charges, retained earnings and other items not covered by the above categories) ..... $ _____

TOTAL LIABILITIES OF WATER SYSTEM ..... $ _____

NOTE: TOTAL ASSETS SHOULD EQUAL TOTAL LIABILITIES.

Thank you very much for your cooperation in this survey!

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PRIVATE SYSTEM QUESTIONNAIRE

CONFIDENTIALITY CLAIM

Notice to Privately Owned Businesses:

You may assert a business confidentiality claim covering part or all of the information by sending at the time of information collection a cover sheet, stamped or typed legend, or other suitable form of notice employing language such as "trade secret," "proprietary," or "company confidential." Confidential portions of otherwise non-confidential documents should be clearly identified. If a confidentiality claim does not accompany the information when it is received, the information may be made available to the public without further notice.

Additional information regarding business confidentiality claims can be found at 40 CFR (Code of Federal Regulations) Part 2 as amended. (Published September 1, 1976, 41FR36902. Amended September 8, 1978, 43FR39997, and March 23, 1979, 44FR17673.)

OMB No. 2000-0389
Expires 12/31/82

Community Water Systems Survey

Survey No. _____

Section I. GENERAL INFORMATION

1. Which of the following categories best describes the ownership structure of your system?

Public

_____ Owned by local government (municipal, state, district, authority, etc.)

_____ Owned by federal government (military base, prison, etc.)

_____ Indian land

Ancillary

Privately owned and operated as a necessary part of another business

_____ Mobile home park

_____ Hospital

_____ School

_____ Institution

_____ Other (describe) _____

_____

_____

Private

Privately owned and operated primarily as a water business

Owned by

_____ Homeowners' Association or Subdivision

_____ Investors

_____ Other

2. What is the total permanent residential population served directly by your system (excluding transient users and population served directly through wholesales):

_____

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Section I. GENERAL INFORMATION (continued)

3. How much additional residential population, if any, does your system serve on a seasonal basis (that is, population served only 2-3 months during the year)?

_____

NOTE: IF YOUR SYSTEM IS CLASSIFIED AS ANCILLARY, PLEASE ANSWER QUESTIONS 4 AND 5.

4. What percent of your permanent residential population is:

_____ Less than 10 years old?

_____ More than 60 years old?

5. On average, how long are people served by your system (i.e., how long is it before they move out of your service area)? Check one:

_____ Less than 2 years

_____ 2-5 years

_____ Over 5 years

6. Please record the number of active *service connections* you have in *each* of the following service categories:

SERVICE CATEGORY	NUMBER OF ACTIVE SERVICE CONNECTIONS IN EACH CATEGORY
Residential connections	
Commercial/industrial connections (e.g. stores, factories, etc.)	
Wholesale connections (i.e., customers who redistribute your water to other users)	
Other (e.g., agricultural connections, municipal/institutional connections—town, hospitals, etc.)	
Fire connections	
TOTAL CONNECTIONS	

NOTE: IF YOUR SYSTEM HAS LESS THAN 15 TOTAL ACTIVE SERVICE CONNECTIONS AND LESS THAN 25 PERMANENT RESIDENTS, YOU NEED NOT CONTINUE ANSWERING THE REST OF THE QUESTIONS.

Section II. OPERATING DATA

PRODUCTION AND STORAGE

7. Please indicate the amount of water in gallons your system pumped (i.e., the amount of water to the distribution system) in 1980 from each of the following sources.

	GALLONS PUMPED BY SYSTEM IN 1980
Surface water	
Groundwater	
Purchased water (surface or ground)	
TOTAL WATER PUMPED BY YOUR SYSTEM FROM ALL SOURCES	

8. In 1980, excluding purchased water, what was the maximum number of gallons your system produced in any *one day* (that is, your maximum day production)?

_____ gallons produced in maximum day

9. What is your system's treated water storage capacity?

_____ gallons

DELIVERIES

10. Please indicate the total amount of water you delivered (including purchased water, if any) to each of the following types of customers in 1980. Please include unmetered deliveries, if any, in your estimate.

SERVICE CATEGORY	GALLONS DELIVERED IN 1980
Residential connections	
Commercial/industrial connections (e.g., stores, factories, etc.)	
Wholesale connections (i.e., customers who redistribute your water to other users)	
Other (e.g., agricultural connections, municipal/institutional connections—towns, hospitals, etc.)	
Fire connections	
TOTAL GALLONS DELIVERED BY YOUR SYSTEM	

11a. What percent of your system's sales go to metered customers?

____ 0%
____ 1-50%
____ 50-80%
____ 80-100%

NOTE: IF MORE THAN 50 PERCENT OF YOUR SALES ARE TO METERED CUSTOMERS, PLEASE ANSWER THE FOLLOWING QUESTION.

b. Approximately what percent of your 1980 production was lost or unaccounted for in 1980?

_____ %

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Section II. OPERATING DATA (continued)

DISTRIBUTION SYSTEM

12. How many miles of distribution system (transmission and distribution mains, not connections or service laterals) does your system have? Please exclude transmission of raw water to treatment plant if possible.

_____ Less than 1 mile
_____ 1 - 5 miles
_____ 5 - 25 miles
_____ 25 - 100 miles
_____ 100 - 500 miles
_____ 500 - 1000 miles
_____ 1000 - 2500 miles
_____ Over 2500 miles

13. Approximately what percent of your distribution system (transmission and distribution mains, not connections) is made up of each of the following types of pipe?

_____% Concrete . . . if it is lined, what is the lining? _____
_____% Asbestos cement . . . if it is lined, what is the lining? _____
_____% Cast or ductile iron . . . if it is lined, what is the lining? _____
_____% Plastic . . . if it is lined, what is the lining? _____
_____% Other . . . specify type _____
_____ Do not know

OPERATORS

14a. How many treatment plant operators does your system have? _____
NOTE: IF THERE ARE NO TREATMENT PLANT OPERATORS, SKIP TO QUESTION 17.

b. How many are full-time? _____

c. How many are part-time? _____

d. Do any of the part-time operators also service other water systems in the area?

_____ Yes
_____ No
_____ Unsure

15. How many of the operators are certified by the state? _____

16. On average how many hours per week does each operator spend at the water treatment plant operation?

_____

Section II. OPERATING DATA (continued)

REGIONALIZATION

17. Is your system *actively* involved in a physical regionalization (i.e., is it physically hooked up to another system)?

_____ Yes, used for emergency situations only
_____ Yes, used for other than emergency situations
_____ No

18. Is your system *actively* involved in a management regionalization (i.e., do you share billing procedures, or other management services)?

_____ Yes
_____ No

ALTERNATIVE SUPPLIES

19a. If your present source became unusable, is there a nearby surface water supply which could serve as an alternate (i.e., a usable lake or river)?

_____ Yes
_____ No
_____ Do not know

b. If yes, how far away is it?

_____ miles

20. Is there a nearby groundwater supply (that is, a usable aquifer) which could serve as an alternative if your present source became unusable?

_____ Yes
_____ No
_____ Do not know

Section III. WATER SOURCE

21. In total, how many wells or springs does your system generally operate?

_____

NOTE: IF 1 OR NONE, SKIP TO QUESTION 25.

22. Are all the wells in one general location? (That is, are they all within a few hundred feet of one another)?

_____ Yes
_____ No

23. If not, how many groups of wells (i.e., wells that are within a few hundred feet of one another) are there in the system?

_____

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Section III. WATER SOURCE (continued)

24a. How far apart are the two closest groups of wells? _____

24b. How far apart are the two farthest groups of wells? _____

Check:	a. Closest	b. Farthest
Up to ½ mile	_____	_____
½ - 2 miles	_____	_____
2 - 5 miles	_____	_____
5 - 10 miles	_____	_____
Unsure	_____	_____

25. In total, from how many surface water sources does the system receive water (count upstream lakes and rivers, not just intakes from reservoirs)?

_____

26. Does your system treat its water?

_____ Yes

_____ No *NOTE: IF NO, SKIP TO QUESTION 32.*

27. If yes, where is the water treated?

_____ Each well or water source

_____ Central treatment locations (how many are there? #_____)

28. What is the capacity of each of the treatment locations (i.e., the amount that could be pumped and treated at each location in a day)?

Treatment Plant #1 _____ gallons/day

Treatment Plant #2 _____ gallons/day

Treatment Plant #3 _____ gallons/day

Treatment Plant #4 _____ gallons/day

Treatment Plant #5 _____ gallons/day

Treatment Plant #6 _____ gallons/day

29. What is the water source of each of the treatment locations?

	Treatment Plant					
	#1	#2	#3	#4	#5	#6
Surface	1. _____	2. _____	3. _____	4. _____	5. _____	6. _____
Ground	1. _____	2. _____	3. _____	4. _____	5. _____	6. _____
Mixed	1. _____	2. _____	3. _____	4. _____	5. _____	6. _____

Section III. WATER SOURCE (continued)

30. For each treatment location, what forms of treatment are performed?

TREATMENT TYPE	Treatment Plant #1	#2	#3	#4	#5	#6
Disinfection						
Ammonia & Chlorine (chloramines)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Free Chlorine (e.g., liquid chlorine products)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Hypochlorite (e.g., powdered chlorine products)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Other Disinfection	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Conventional Plant (coagulation, sedimentation, filtration)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Direct Filtration	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Fluoride Addition	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Fluoride Removal	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Corrosion Control	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Granular Activated Carbon	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Powdered Activated Carbon	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Aeration	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Lime Soda Softening	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Iron Removal	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Ammoniation	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Reverse Osmosis	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Activated Alumina	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Cation Exchange	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Anion Exchange	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Other (please describe)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____

_____

_____

Section III. WATER SOURCE (continued)

NOTE: IF YOU CHLORINATE AND HAVE FILTRATION, PLEASE ANSWER QUESTIONS 31a - 31d.

31a. Do you prechlorinate (that is, chlorinate before settling and filtration)?

_____ Yes

_____ No

b. Do you chlorinate after filtration?

_____ Yes

_____ No

c. Do you boost chlorine residuals in the distribution system?

_____ Yes

_____ No

d. If yes, is this done on a continuous or periodic basis?

_____ Continuous

_____ Periodic

Section IV. PRIVATE SYSTEM FINANCIAL INFORMATION

NOTE: PLEASE NOTE THAT THE FINANCIAL INFORMATION NEEDED IS APPLICABLE ONLY TO DRINKING WATER SUPPLY OPERATIONS. IF YOUR SYSTEM IS CONSOLIDATED WITH ANOTHER ENTITY (FOR EXAMPLE, A SUBSIDIARY OF A MULTI-SYSTEM COMPANY), PLEASE TRY TO PROVIDE YOUR BEST ESTIMATE OF FINANCIAL INFORMATION WHICH IS APPLICABLE TO YOUR WATER SYSTEM ONLY. IF YOUR WATER SYSTEM HAS AN ANNUAL REPORT OR OTHER FINANCIAL STATEMENT, IT WOULD BE EXTREMELY HELPFUL IF YOU COULD FORWARD A COPY TO EPA COMMUNITY WATER SYSTEMS SURVEY, TEMPLE, BARKER & SLOANE, 33 HAYDEN AVENUE, LEXINGTON, MA 02173.

32a. The following information is based on financial data for: *(NOTE: Please use calendar year 1990 if possible.)*

FROM: Month _____ Year _____

THROUGH: Month _____ Year _____

b. Which of the following categories most closely describes the financial information available for your water system?

_____ Data above are based primarily on financial records applicable to the water operations of this system

_____ Data above are based primarily on estimates

REVENUES

33. Please indicate your total revenues *from water operations* from each of the following service categories (include sales, hook-ups, connection fees).

SERVICE CATEGORY	TOTAL ANNUAL REVENUES FROM WATER OPERATIONS
Revenues from residential connections	$ _____
Revenues from commercial/industrial connections	$ _____
Revenues from wholesale connections (i.e., customers who redistribute your water to other users)	$ _____
Other revenues from water sales (e.g., agricultural connections, municipal/institutional connections—towns, hospitals, etc.)	$ _____
TOTAL revenues from water sales	$ _____
Revenues from initiation of connections, i.e., hook-ups	$ _____
TOTAL REVENUES FROM WATER OPERATIONS	$ _____

34a. Does your system have other sources of revenue (e.g., power sales, recreation)?

_____ Yes

_____ No

b. If yes, what is the revenue from these other sources?

$_____

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Section IV. PRIVATE SYSTEM FINANCIAL INFORMATION (continued)

EXPENSES

35. Please indicate the total operating expenses of your water system in 1980, and, to the best of your ability, the division of the total operating expenses among the following categories:

Operating and Maintenance (e.g., chemicals, salaries, power) ..... $ _____

Other operating costs (do not include interest or principal repayment) ..... $ _____

Depreciation and amortization of plant and equipment ..... $ _____

TOTAL OPERATING EXPENSES OF WATER SYSTEM ..... $ _____

36. Please indicate the taxes paid by your water system for 1980.

Federal taxes ..... $ _____

State taxes ..... $ _____

Local taxes ..... $ _____

TOTAL TAXES ..... $ _____

37. Please indicate the total debt-related expenses of the system ..... $ _____

Interest expense: ..... $ _____

Repayment of principal: ..... $ _____

38. What was the net profit or loss of your system in 1980? (Should equal Revenues - Operating Expenses - Taxes -Interest) ..... $ _____

WATER RATES

39a. How do you charge for water service (check one)?

_____ Flat fee . . . How much is it? $_____

_____ Flat rate per thousand gallons . . . How much is it? $_____ per 1000 gallons

_____ Charges based on non-water use measure (e.g., frontage feet, size of service connection, lot size) . . . How much is it? $_____ per _____

_____ Combination (e.g., flat fee with rates based on usage above a certain amount) . . . How much is it? _____

_____ Declining block rate per thousand gallons (meter) . . . See Question 39b.

_____ Increasing block rate per thousand gallons (meter) . . . See Question 39b.

_____ Other . . . Please explain rate structure and amount. _____

_____

_____

SECTION IV. PRIVATE SYSTEM FINANCIAL INFORMATION (continued)

NOTE: PLEASE ANSWER QUESTION 39b IF YOU CHARGE DECLINING OR INCREASING BLOCK RATES

39b. What are your prices per unit of water usage and how do these change as the volume of water usage increases? Please note the prices, units, and block sizes for residential, commercial, and wholesale customers.

Residential		Commercial/Industrial		Wholesale	
Price/Unit (e.g., $/1,000 gal)	Block or Unit (e.g., 5,000 gal)	Price/Unit (e.g., $/1,000 gal)	Block or Unit (e.g., 5,000 gal)	Price/Unit (e.g., $/1,000 gal)	Block or Unit (e.g., 5,000 gal)
$____/____	gals for the first ____ gals	$____/____	gals for the first ____ gals	$____/____	gals for the first ____ gals
$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals
$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals
$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals	$____/____	gals for the next ____ gals

40. What is your minimum residential charge and how much water is included in the minimum charge?

$_____ for _____ gallons

or

$_____ for _____ cubic feet

_____ No minimum charge

41. What is the average annual water use per residential customer (family) in your system?

_____ gallons

42. Is your water system required by law to obtain approval from a state regulatory agency or authority prior to changing its rates?

_____ Yes

_____ No

_____ Unsure

FINANCING OF EXPENDITURES

43. Since 1975, have you made any major expenditures (e.g., purchase of equipment, major modifications, or major overhauls) to improve water quality (i.e., not simply to increase capacity)?

_____ Yes

_____ No

44. If yes, what did you do? Type of equipment purchased:

Chlorinator _____

Other disinfection _____

Filtration equipment _____

Other (please explain) _____

_____

Section IV. PRIVATE SYSTEM FINANCIAL INFORMATION (continued)

45. What was the nature of the improvement in water quality?

Coliform _____
Turbidity _____
Banium _____
Arsenic _____
Silver _____
Nitrates _____
Fluoride _____
Cadmium _____
Chromium _____
Lead _____
Mercury _____

Other (please explain) _____

_____

_____

46. What prompted the improvements?

_____ Response to a regulation
_____ Upgrade/replacement of equipment
_____ Other (please explain) . . . _____

47. How was the improvement financed?

_____ Bank Loan
_____ Company Bonds
_____ Industrial Revenue Bonds
_____ Payment from capital reserve fund
_____ Special Assessment
_____ Stock Issue
_____ Other (please explain) _____

_____

Section IV. PRIVATE SYSTEM FINANCIAL INFORMATION (continued)

48. If your bonds are rated by a rating service, what is their current rating and what service rated them?

_____ Not Rated or No Bonds Issued

Moody's	Aaa	_____	B	_____
	Aa	_____	Caa	_____
	A	_____	Ca	_____
	Baa	_____	C	_____
	Ba	_____	D	_____
Standard & Poors	AAA	_____	B	_____
	AA	_____	CCC	_____
	A	_____	CC	_____
	BBB	_____	C	_____
	BB	_____	D	_____

49. Please indicate to the best of your ability, the division of the total assets of your water system among the following categories:

CATEGORIES OF ASSETS

Current Assets (cash, accounts receivable, prepaid expenses) ..... $ _____

Plant and equipment valued at original cost

Production-treatment plant(s) ..... $ _____

Distribution system ..... $ _____

All other plant and equipment ..... $ _____

TOTAL plant and equipment ..... $ _____

Less accumulated depreciation ..... $ _____

TOTAL net plant and equipment ..... $ _____

Other Assets not included in above categories (please explain) ..... $ _____

_____

TOTAL ASSETS OF WATER SYSTEM ..... $ _____

50. Please indicate the following balance sheet categories:

Current liabilities (accounts payable, accrued expenses, etc.) ..... $ _____

Long-term debt (over 1 year to maturity) ..... $ _____

Paid-in capital (common stock, paid-in surplus, preferred stock) ..... $ _____

Retained earnings (accumulated surplus) ..... $ _____

TOTAL LIABILITIES OF WATER SYSTEM ..... $ _____

NOTE: TOTAL ASSETS SHOULD EQUAL TOTAL LIABILITIES.

Thank you very much for your cooperation in this survey!

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ANCILLARY SYSTEM QUESTIONNAIRE

OMB No. 2000-0389
Expires 12/31/82

Community Water Systems Survey

Survey No. _____

Section I. GENERAL INFORMATION

1. Which of the following categories best describes the ownership structure of your system?

Public

_____ Owned by local government (municipal, state, district, authority, etc.)

_____ Owned by federal government (military base, prison, etc.)

_____ Indian land

Ancillary

Privately owned and operated as a necessary part of another business

_____ Mobile home park

_____ Hospital

_____ School

_____ Institution

_____ Other (describe) _____

_____

_____

Private

Privately owned and operated primarily as a water business

Owned by

_____ Homeowners' Association or Subdivision

_____ Investors

_____ Other

2. What is the total permanent residential population served directly by your system (excluding transient users and population served directly through wholesales):

_____

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Section I. GENERAL INFORMATION (continued)

3. How much additional residential population, if any, does your system serve on a seasonal basis (that is, population served only 2-3 months during the year)?

_____

NOTE: IF YOUR SYSTEM IS CLASSIFIED AS ANCILLARY, PLEASE ANSWER QUESTIONS 4 AND 5.

4. What percent of your permanent residential population is:

_____ Less than 10 years old?

_____ More than 60 years old?

5. On average, how long are people served by your system (i.e., how long is it before they move out of your service area)? Check one:

_____ Less than 2 years

_____ 2-5 years

_____ Over 5 years

6. Please record the number of active *service connections* you have in *each* of the following service categories:

SERVICE CATEGORY	NUMBER OF ACTIVE SERVICE CONNECTIONS IN EACH CATEGORY
Residential connections	
Commercial/industrial connections (e.g. stores, factories, etc.)	
Wholesale connections (i.e., customers who redistribute your water to other users)	
Other (e.g., agricultural connections, municipal/institutional connections—town, hospitals, etc.)	
Fire connections	
TOTAL CONNECTIONS	

NOTE: IF YOUR SYSTEM HAS LESS THAN 15 TOTAL ACTIVE SERVICE CONNECTIONS AND LESS THAN 25 PERMANENT RESIDENTS, YOU NEED NOT CONTINUE ANSWERING THE REST OF THE QUESTIONS.

Section II. OPERATING DATA

PRODUCTION AND STORAGE

7. Please indicate the amount of water in gallons your system pumped (i.e., the amount of water to the distribution system) in 1980 from each of the following sources.

	GALLONS PUMPED BY SYSTEM IN 1980
Surface water	
Groundwater	
Purchased water (surface or ground)	
TOTAL WATER PUMPED BY YOUR SYSTEM FROM ALL SOURCES	

8. In 1980, excluding purchased water, what was the maximum number of gallons your system produced in any *one day* (that is, your maximum day production)?

_____ gallons produced in maximum day

9. What is your system's treated water storage capacity?

_____ gallons

DELIVERIES

10. Please indicate the total amount of water you delivered (including purchased water, if any) to each of the following types of customers in 1980. Please include unmetered deliveries, if any, in your estimate.

SERVICE CATEGORY	GALLONS DELIVERED IN 1980
Residential connections	
Commercial/Industrial connections (e.g., stores, factories, etc.)	
Wholesale connections (i.e., customers who redistribute your water to other users)	
Other (e.g., agricultural connections, municipal/institutional connections—towns, hospitals, etc.)	
Fire connections	
TOTAL GALLONS DELIVERED BY YOUR SYSTEM	

11a. What percent of your system's sales go to metered customers?

_____ 0%
_____ 1-50%
_____ 50-80%
_____ 80-100%

NOTE: IF MORE THAN 50 PERCENT OF YOUR SALES ARE TO METERED CUSTOMERS, PLEASE ANSWER THE FOLLOWING QUESTION.

b. Approximately what percent of your 1980 production was lost or unaccounted for in 1980?

_____ %

Section II. OPERATING DATA (continued)

DISTRIBUTION SYSTEM

12. How many miles of distribution system (transmission and distribution mains, not connections or service laterals) does your system have? Please exclude transmission of raw water to treatment plant if possible.

_____ Less than 1 mile
_____ 1 - 5 miles
_____ 5 - 25 miles
_____ 25 - 100 miles
_____ 100 - 500 miles
_____ 500 - 1000 miles
_____ 1000 - 2500 miles
_____ Over 2500 miles

13. Approximately what percent of your distribution system (transmission and distribution mains, not connections) is made up of each of the following types of pipe?

_____% Concrete . . . if it is lined, what is the lining? _____
_____% Asbestos cement . . . if it is lined, what is the lining? _____
_____% Cast or ductile iron . . . if it is lined, what is the lining? _____
_____% Plastic . . . if it is lined, what is the lining? _____
_____% Other . . . specify type _____
_____ Do not know

OPERATORS

14a. How many treatment plant operators does your system have? _____
NOTE: IF THERE ARE NO TREATMENT PLANT OPERATORS, SKIP TO QUESTION 17.

b. How many are full-time? _____

c. How many are part-time? _____

c. Do any of the part-time operators also service other water systems in the area?

_____ Yes
_____ No
_____ Unsure

15. How many of the operators are certified by the state? _____

16. On average how many hours per week does each operator spend at the water treatment plant operation?

_____

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Section II. OPERATING DATA (continued)

REGIONALIZATION

17. Is your system *actively* involved in a physical regionalization (i.e., is it physically hooked up to another system)?

_____ Yes, used for emergency situations only
_____ Yes, used for other than emergency situations
_____ No

18. Is your system *actively* involved in a management regionalization (i.e., do you share billing procedures, or other management services)?

_____ Yes
_____ No

ALTERNATIVE SUPPLIES

19a. If your present source became unusable, is there a nearby surface water supply which could serve as an alternate (i.e., a usable lake or river)?

_____ Yes
_____ No
_____ Do not know

b. If yes, how far away is it?

_____ miles

20. Is there a nearby groundwater supply (that is, a usable aquifer) which could serve as an alternative if your present source became unusable?

_____ Yes
_____ No
_____ Do not know

Section III. WATER SOURCE

21. In total, how many wells or springs does your system generally operate?

_____

NOTE: IF 1 OR NONE, SKIP TO QUESTION 25.

22. Are all the wells in one general location? (That is, are they all within a few hundred feet of one another)?

_____ Yes
_____ No

23. If not, how many groups of wells (i.e., wells that are within a few hundred feet of one another) are there in the system?

_____

Section III. WATER SOURCE (continued)

24a. How far apart are the two closest groups of wells? _____

24b. How far apart are the two farthest groups of wells? _____

Check:	a. Closest	b. Farthest
Up to ½ mile	_____	_____
½ - 2 miles	_____	_____
2 - 5 miles	_____	_____
5 - 10 miles	_____	_____
Unsure	_____	_____

25. In total, from how many surface water sources does the system receive water (count upstream lakes and rivers, not just intakes from reservoirs)?

_____

26. Does your system treat its water?

_____ Yes

_____ No *NOTE: IF NO, SKIP TO QUESTION 32.*

27. If yes, where is the water treated?

_____ Each well or water source

_____ Central treatment locations (how many are there? #_____)

28. What is the capacity of each of the treatment locations (i.e., the amount that could be pumped and treated at each location in a day)?

Treatment Plant #1 _____ gallons/day

Treatment Plant #2 _____ gallons/day

Treatment Plant #3 _____ gallons/day

Treatment Plant #4 _____ gallons/day

Treatment Plant #5 _____ gallons/day

Treatment Plant #6 _____ gallons/day

29. What is the water source of each of the treatment locations?

	Treatment Plant					
	#1	#2	#3	#4	#5	#6
Surface	1. _____	2. _____	3. _____	4. _____	5. _____	6. _____
Ground	1. _____	2. _____	3. _____	4. _____	5. _____	6. _____
Mixed	1. _____	2. _____	3. _____	4. _____	5. _____	6. _____

Section III. WATER SOURCE (continued)

30. For each treatment location, what forms of treatment are performed?

TREATMENT TYPE	Treatment Plant #1	#2	#3	#4	#5	#6
Disinfection						
Ammonia & Chlorine (chloramines)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Free Chlorine (e.g., liquid chlorine products)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Hypochlorite (e.g., powdered chlorine products)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Other Disinfection	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Conventional Plant (coagulation, sedimentation, filtration)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Direct Filtration	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Fluoride Addition	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Fluoride Removal	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Corrosion Control	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Granular Activated Carbon	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Powdered Activated Carbon	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Aeration	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Lime Soda Softening	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Iron Removal	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Ammoniation	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Reverse Osmosis	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Activated Alumina	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Cation Exchange	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Anion Exchange	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____
Other (please describe)	1. ____	2. ____	3. ____	4. ____	5. ____	6. ____

_____

_____

Section III. WATER SOURCE (continued)

NOTE: IF YOU CHLORINATE AND HAVE FILTRATION, PLEASE ANSWER QUESTIONS 31a - 31d.

31a. Do you prechlorinate (that is, chlorinate before settling and filtration)?

_____ Yes

_____ No

b. Do you chlorinate after filtration?

_____ Yes

_____ No

c. Do you boost chlorine residuals in the distribution system?

_____ Yes

_____ No

d. If yes, is this done on a continuous or periodic basis?

_____ Continuous

_____ Periodic

Section IV. ANCILLARY BUSINESS FINANCIAL INFORMATION

32. The following information is based on financial data for: *(NOTE: Please use calendar year 1980 if possible.)*

FROM: Month _____ Year _____

THROUGH: Month _____ Year _____

33. Please indicate the total operating expenses, excluding interest, of your primary business (i.e., not just water operations) for 1980, and, to the best of your ability, the total state, local, and federal taxes paid in 1980.

Total Operating Expenses (excluding interest but including depreciation)	$ _____
Taxes	$ _____

34. Please indicate the debt-related expenses in 1980.

Interest Expense	$ _____
Repayment of Principal	$ _____

35. What was the net profit or loss before taxes of your business in 1980?

_____ Loss (do not indicate dollar amount)

_____ 0 - $10,000

_____ $10,000 - $50,000

_____ $50,000 - $100,000

_____ $100,000 - $250,000

_____ Greater than $250,000

36. How do you charge for water service (check one)?

_____ Not billed separately; included in rent or charge for primary services

_____ Flat fee . . . How much is it? $_____

_____ Flat rate per thousand gallons . . . How much is it? $_____ per 1000 gallons

_____ Charges based on non-water use measure (e.g., frontage feet, size of service connection, lot size) . . . How much is it? $_____ per _____

_____ Combined (e.g., flat fee with rates based on usage above a certain amount) . . . How much is it? _____

_____ Declining block rate per thousand gallons (meter)

_____ Increasing block rate per thousand gallons (meter)

_____ Other . . . Please explain _____

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Section IV. ANCILLARY PRIVATE SYSTEM FINANCIAL INFORMATION (continued)

NOTE: PLEASE ANSWER QUESTION 36b IF YOU CHARGE DECLINING OR INCREASING BLOCK RATES.

36b. What are your prices per unit of water usage and how do these change as the volume of water usage increases? Please note the prices, units and block sizes.

Price/Unit (e.g., $/1,000 gal)	Block or Unit (e.g., 5,000 gal)
$_____ / _____ gals	for the first _____ gals
$_____ / _____ gals	for the next _____ gals
$_____ / _____ gals	for the next _____ gals
$_____ / _____ gals	for the next _____ gals

37a. If customers do not pay separately for water, is the cost of water service factored in when setting rents or charges for primary services?

_____ Yes

_____ No

b. If yes, approximately what portion of the charge is attributable to water service costs?

_____ %

38. What is the average annual water use per residential customer (family) in your system?

_____ gallons

39. Please indicate the total assets of your primary business and to the best of your ability, the portion of your total assets accounted for in the categories listed:

TOTAL assets (including plant and equipment valued at cost and current assets) of primary business *and* water system ..... $ _____

Less Accumulated Depreciation or sinking fund for replacement if any (for *all* assets) ..... $ _____

TOTAL net assets ..... $ _____

40. What percent of your TOTAL assets is related to the water system only? ..... _____ %

41. What was your long-term debt (over 1 year to maturity) in 1980? ..... $ _____

Thank you very much for your cooperation in this survey!

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